TIA Portal V20

Technical slides

Release version 1.3

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TIA Portal V20
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- **Modular Application Creator**
- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

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WinCC Unified V20

Performance (ES & compile & RT)

- Improve Delta compile capability for connections
- ES Resource Monitor Overview of Multiplex Tags
- Enhanced performance in runtime
- Optimized Tag Multiplexing
- Optimize high resolution graphics in ES

Engineering Enhancements

- Dynamization overview
- Enhanced expressions
- Rename layer on screen/faceplate level
- Activate Control Toolbar Buttons via HMI Screen Item or Script (*)
- Display of value scaling / measurement unit conversion
- Enhanced Screen Item Navigation and Crosshair Button (*)
- System functions
  - Activate / Deactivate event logger
  - Start /stop logging (alarms, tag, audit) (*)
  - change user (via alias, name/pwd) (*)
- Trigger
  - Script is triggered only on tag value change
  - Tag triggers for Screens and Scheduled Tasks (*)

Central Color palette

- Color palettes in library (*)
- Assign color via scripting and via object picker

Engineering Efficiency

- Corporate Designer
  - Version matching custom styles
  - Target device version for custom styles
- Graphic handling
  - Improvements for display dynamic SVG graphics in preview
  - Editing SVG images with external application
  - New set of dynamic widget
- Library
  - Disable use of faceplate types
  - Create library types: Text lists, Graphics & Scripts
  - Identify cross references for PLC UDT in faceplates
  - Identify and filter Unified library types
- Faceplates
  - *Popup events*
  - *Preview static interface values (WBSE)*
  - Formatted Texts for Text Properties in Faceplates
  - Property interface with expression and conversion functions
  - Text list types in Faceplates and Screens (*)
  - Identify and filter Unified library types
- Standardized Engineering
  - SIMATIC Control Function Library (CFL)

Connectivity

- Support nesting depth up to 26
- Native communication channel LOGO!
- Indirect addressing 1200/1500- multiplex DB Name (*)
- Read/Write a block of data via scripting
- Using umlaut in the address of an OPC UA
- OPC UA Client – Methods (*)
- OPC UA Client – LInt64 & ULInt64 Datatype Support

* as of V19 updates

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WinCC Unified V20

Process Diagnostics
- Change Graph sequence of Graph & ProDiag Overview Control during Runtime (*)
- PLC Code View – Tooltip texts for abbreviated texts

Audit
- Audit of Parameter sets
- Audit for alarm operations (shelve, hide)
- Configurable ESig procedure (*)
- Manipulation detection on audit files (*)

Parameter Control
- Extended number of parameter sets (4000 Elements)
- Control Usability
  - Definition of sorting the parameter sets at ES
  - Search parameter set at RT
- Numeric keyboard support for PaCo
- Audit support of PaCo
- Use of single Tags

Alarm Control enhancements
- Multiline display
- Paging for reading of alarm archives
- Filtering for all columns

Others
- Numeric keyboard for Unified UxP
- Limit a zoom level
- Debugging of JavaScript via VS Code (*), Simatic Unified Air app (*)
- New access to online documentation

User Management
- Authentification via system function
  - ChangeUser (Username & PWD)
  - Secure login without password (Alias)
- Support of RFID in Central User Management (PC)
- Global search for RT rights

Specific start screen (PC RT)
- User specific start screen
- Role specific start screen

Runtime persistency (PC RT)
- On demand persistency and auto persistency for global and personalized settings for alarm control, trend controls, f(x)

Redundancy (PC RT)
- Data redundancy of
  - Current and logged process values
  - Pending and logged alarms
  - Audit trail, Parameter sets
- Supporting S7-300, S7-400, S7-1200, S7-1500
- Base UI redundancy

Unified Data Hub (PC RT)
- Access to data from offline UDH clients
- Automatic backup and restore
- **3rd party access via GraphQL**

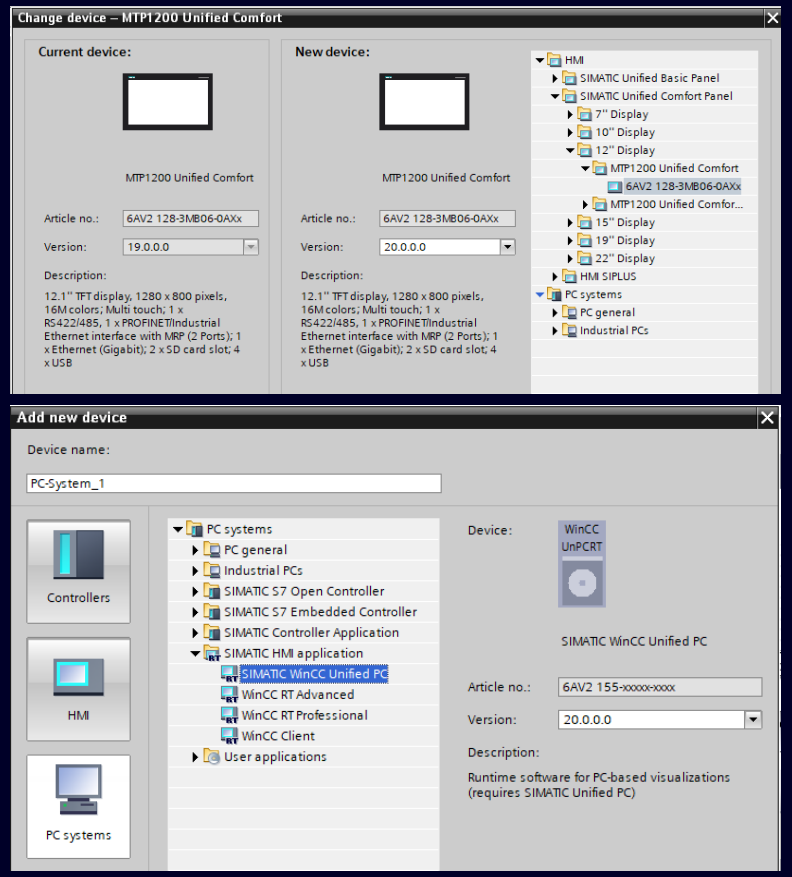
Module Type Package (MTP)
- SIMATIC MTP Integrator for WinCC Unified

* as of V19 updates

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WinCC Unified V20 - Scalability
New device versions

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



New device version for

- ✓ **PC Runtime**
- ✓ **Unified Comfort Panels**
- ✓ **Unified Basic Panels**

New features are available in the corresponding device version only

- ➢ Upgrade the Unified devices
- ➢ Upgrade Faceplates in library (if necessary)
- ➢ Upgrade Custom Web Controls in projects (if necessary)

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WinCC Unified V20 - Performance
Compile Performance

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Compile performance has been improved in certain scenarios

Rebuild should be around 20% - 40% faster compared to V18 depending on the project contents (already V19 Update 1)

Delta Compile improvements are visible when

- Compiling screens
- Compiling small changes in JavaScripts

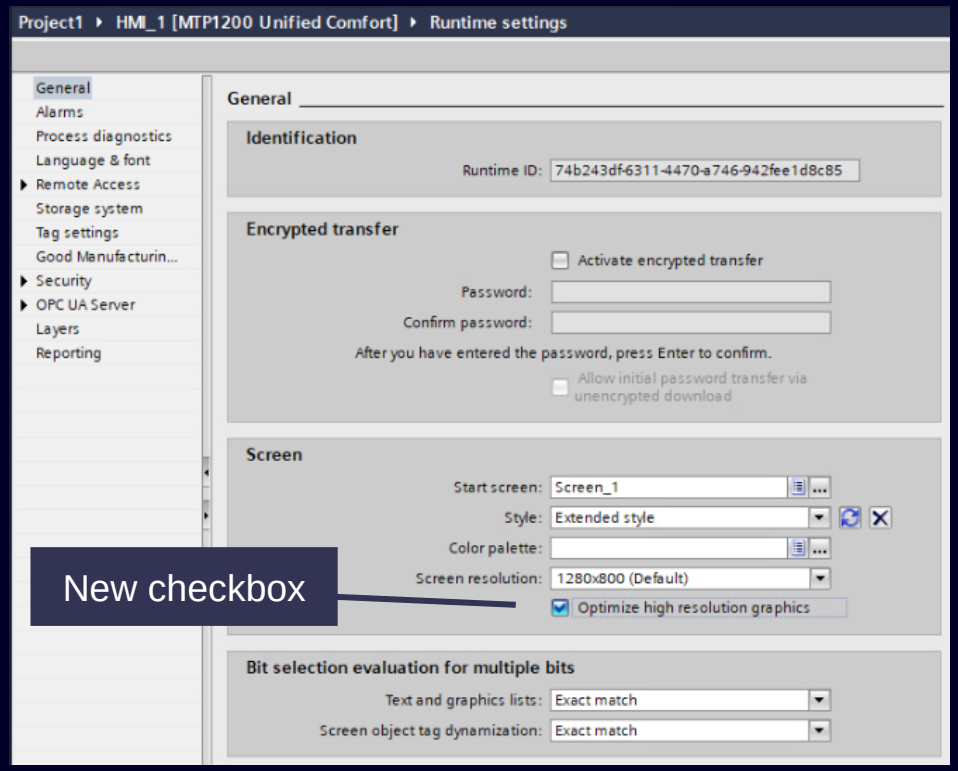
Delta Compile is the preferable compile method!

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WinCC Unified V20 - Performance
Optimize high resolution graphics in ES during configuration

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Optimize high resolution graphics in ES during configuration

Bitmap images are resized during compilation to improved runtime performance due to optimized graphics

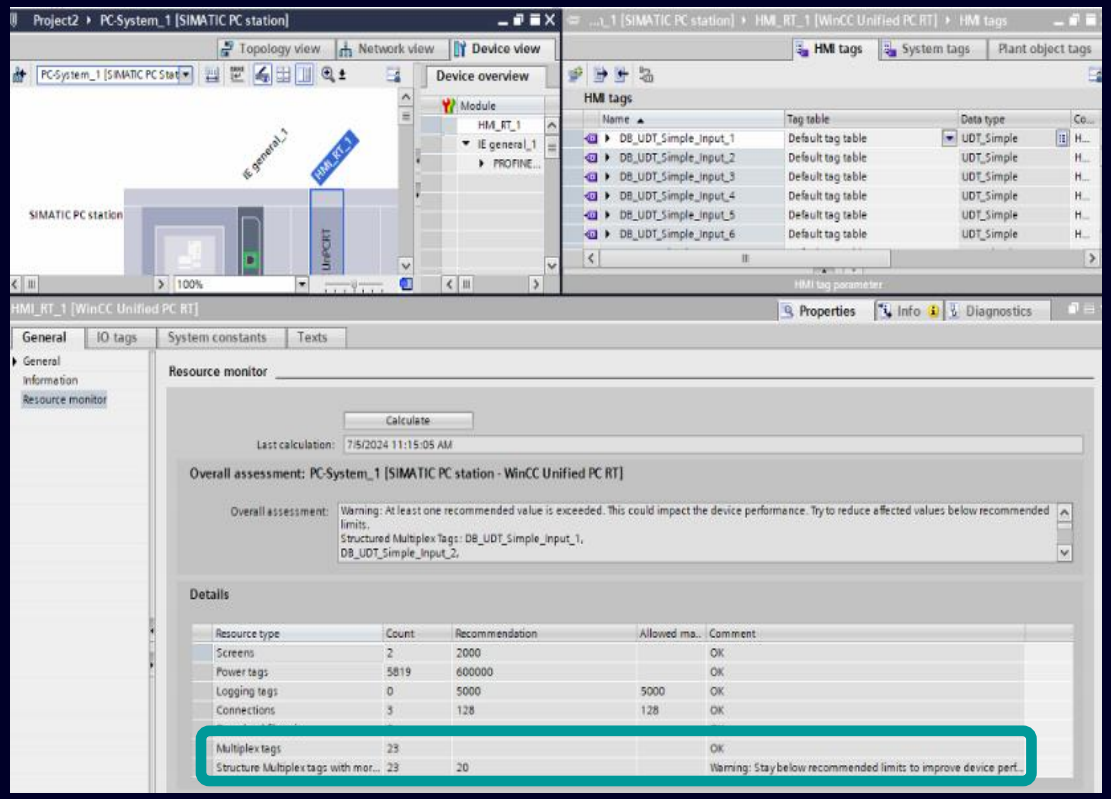
- Resize is based on the usages of the images e.g., high-resolution bitmap used for a button image is resized automatically to the necessary dimension
- No recognizable quality change visible in runtime

SVG-files are not resized, only bitmap graphics can be resized

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WinCC Unified V20 - Performance
Optimized Tag Multiplexing

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Tag multiplexing is optimized for a reduced screen load time

- Multiplexing only on demand for subscribed tags
- Displaying Warning for count over limits.
- Performance hint in engineering (resource monitor)

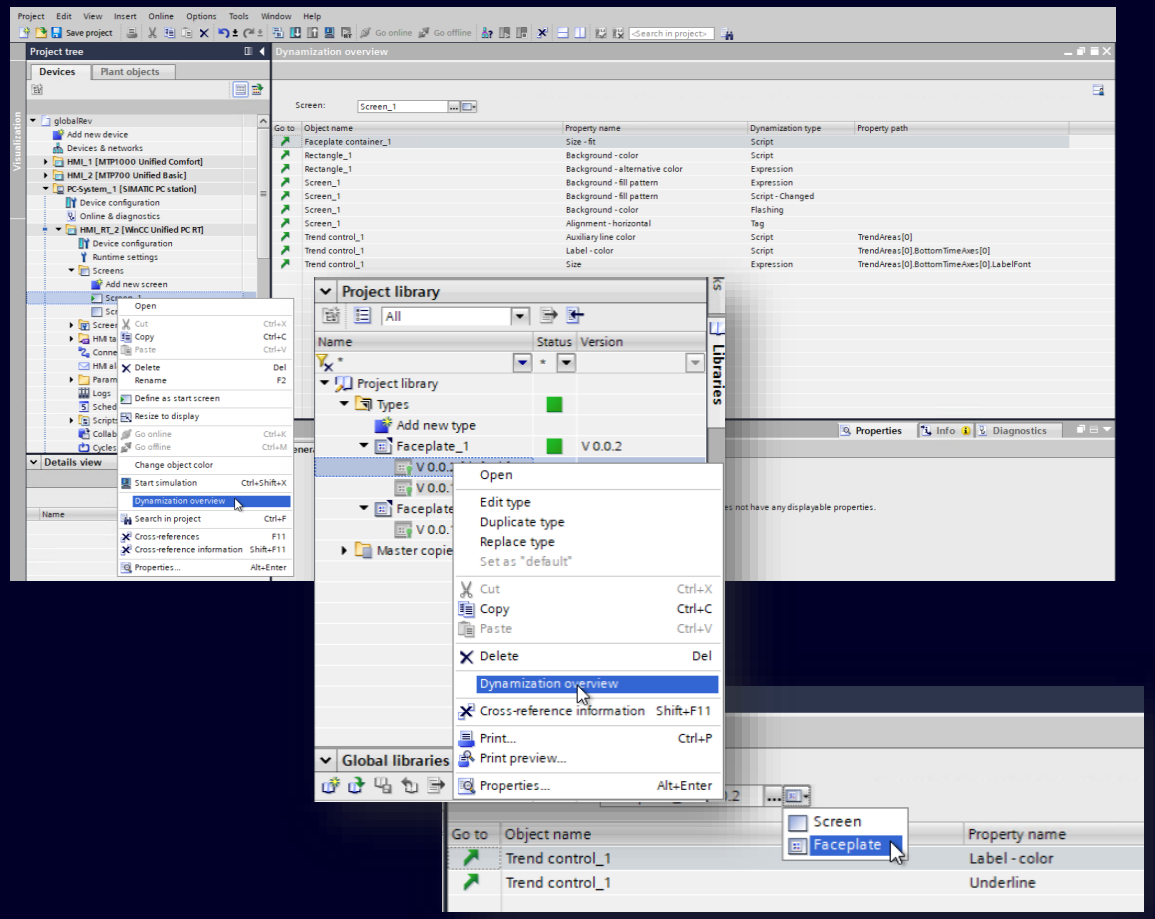
  The Resource Monitor can calculate
  - Number of Multiplex Tags (Index and DBName) with more than 200 Child members
  - Warning Message for user in Overview with HMI Tag Names when there are more tags configured than the limit
  - Device Limits : UBP : 5, UCP : 10, UPC : 20

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WinCC Unified V20 - Engineering Enhancements
Dynamization overview

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Get a fast overview of dynamized objects on screen or faceplate level

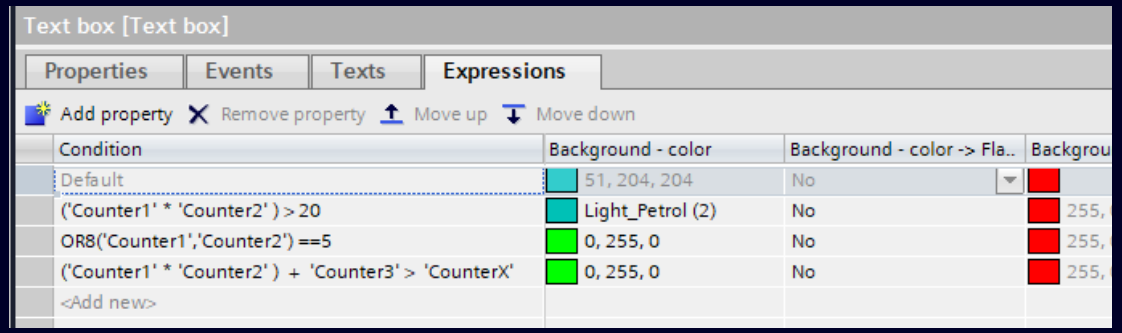
- Display the dynamized objects: Script, expressions, trigger
- Available for screens and faceplates and nested faceplates

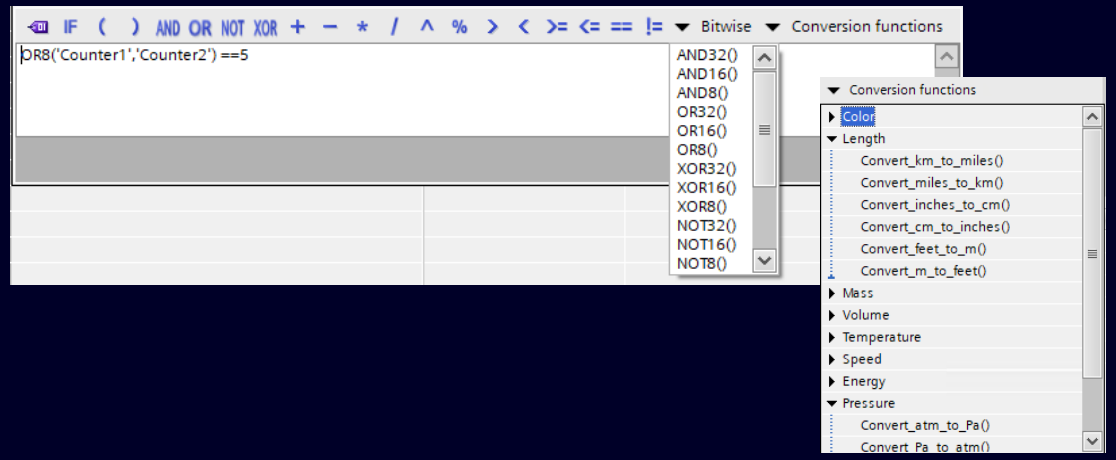
- Jump directly to the dynamized object

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WinCC Unified V20 - Engineering Enhancements
New possibilities with Expression Dynamization

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Functionality of expressions was extended:

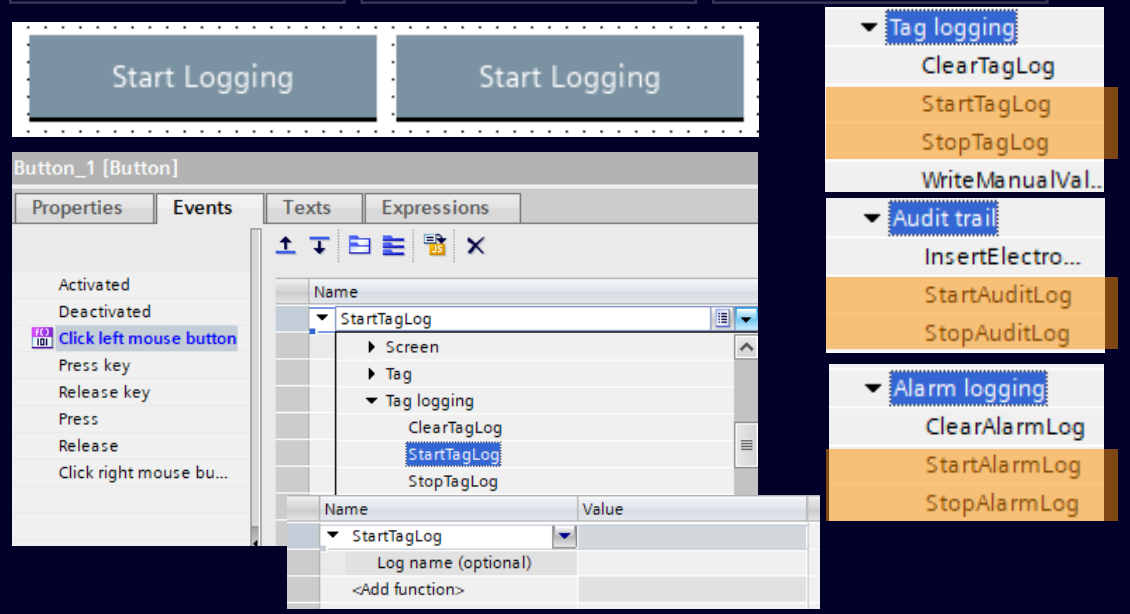
- Support of
  - Mathematical operators
  - Relational operators
  - Bitwise functions
  - Text property dynamization in Expressions
- Usability improvements
  - Copy, paste, delete, reorder
  - validation of expression condition during engineering
  - Copy expression from one screen item to another screen item

as of V19 Update 2

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WinCC Unified V20 - Engineering Enhancements
System function for start / stop logging

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓




```
export async function Button_3_OnTapped(item, x, y, modifiers, trigger) {
try {
    await HMIRuntime.TagLogging.SysFct.StartTagLog(undefined);
}
catch (err) { }

}
```

```
export async function Button_4_OnTapped(item, x, y, modifiers, trigger) {
try {
    await HMIRuntime.TagLogging.SysFct.StopTagLog(undefined);
}
catch (err) { }

}
```

Start and stop the logging in WinCC Unified

Stop and start the logging, if necessary, e.g.
- Only log over dedicated time
- Start log on a dedicated occurrence (Error on plant floor, Product category)
- Logging service for different production operation modes (log for Production, log for maintenance)

Start and stop is available for..
- Tag Logging
- Alarm Logging
- Audit Trail

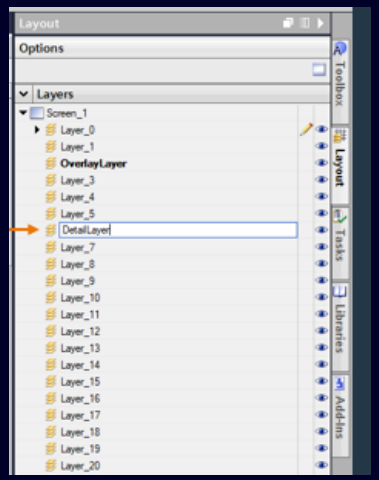
as of V19 Update 2

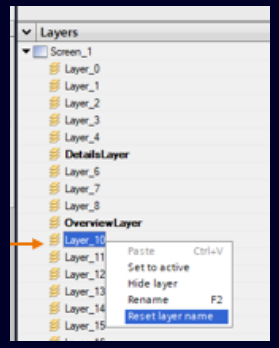
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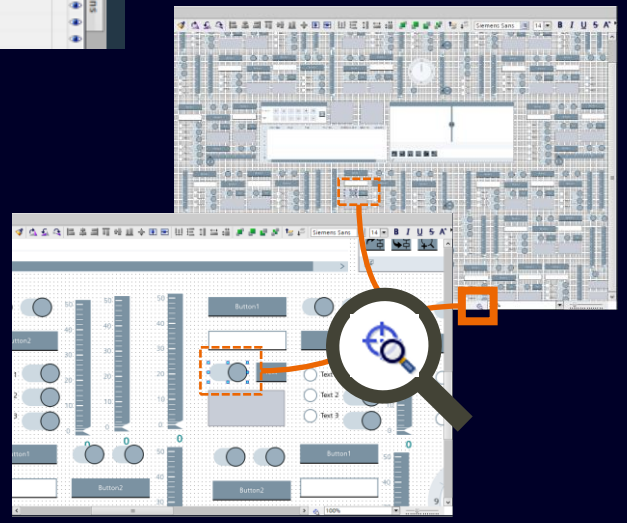
WinCC Unified V20 - Engineering Enhancements

Rename layers at screens and faceplates & Jump to highlighted object in huge screens

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







Rename layers at screens and at faceplates individually

Individual and central renaming of layers can support the structure of your projects!

- Layers of screens can be central renamed in the runtime settings
- Layers of individual screens or faceplates can be renamed separately
- Full script support accessing renamed layers

Jump to highlighted object in huge screens

Enhanced functionality when navigating screen items on a huge screen

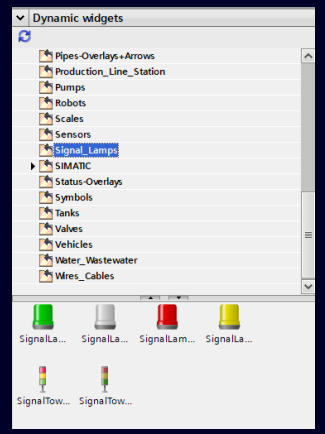
- Crosshair button to center and zoom the selected screen item when working on the editor

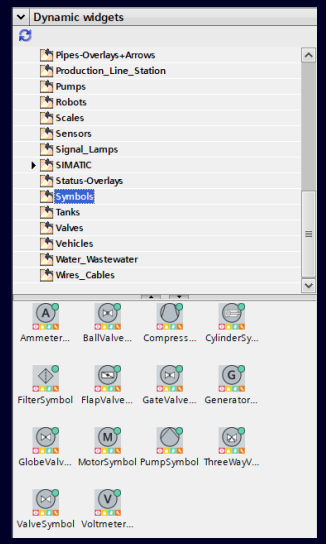
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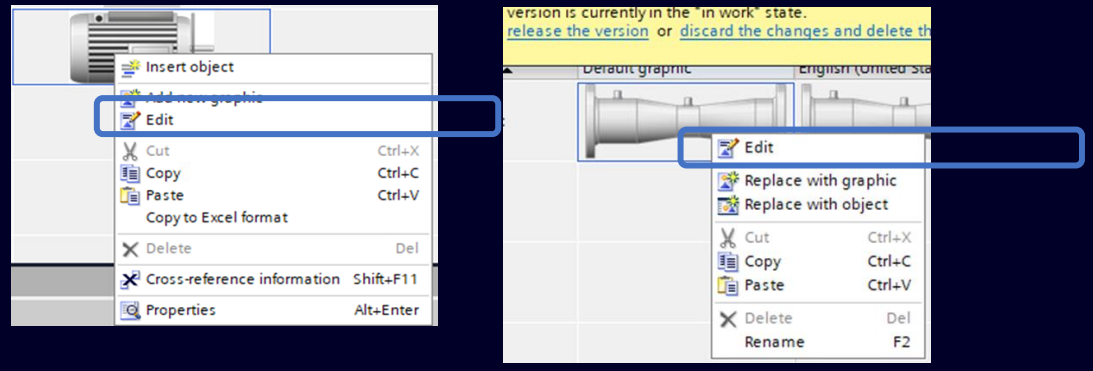
WinCC Unified V20 - Engineering Efficiency

Improvements for dynamic SVG graphics & editing SVG images with external program

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓







Improved thumbnail preview for dynamic widgets

- Dynamic widgets are displayed with the colors predefined in the SVGHMI
  - Same rendering for SVG types in Preview – window for dynamic SVG types as in screen editor
  - Drag & Drop new dynamic widget from the Toolbox into the editor of a dynamic SVG type inside the library

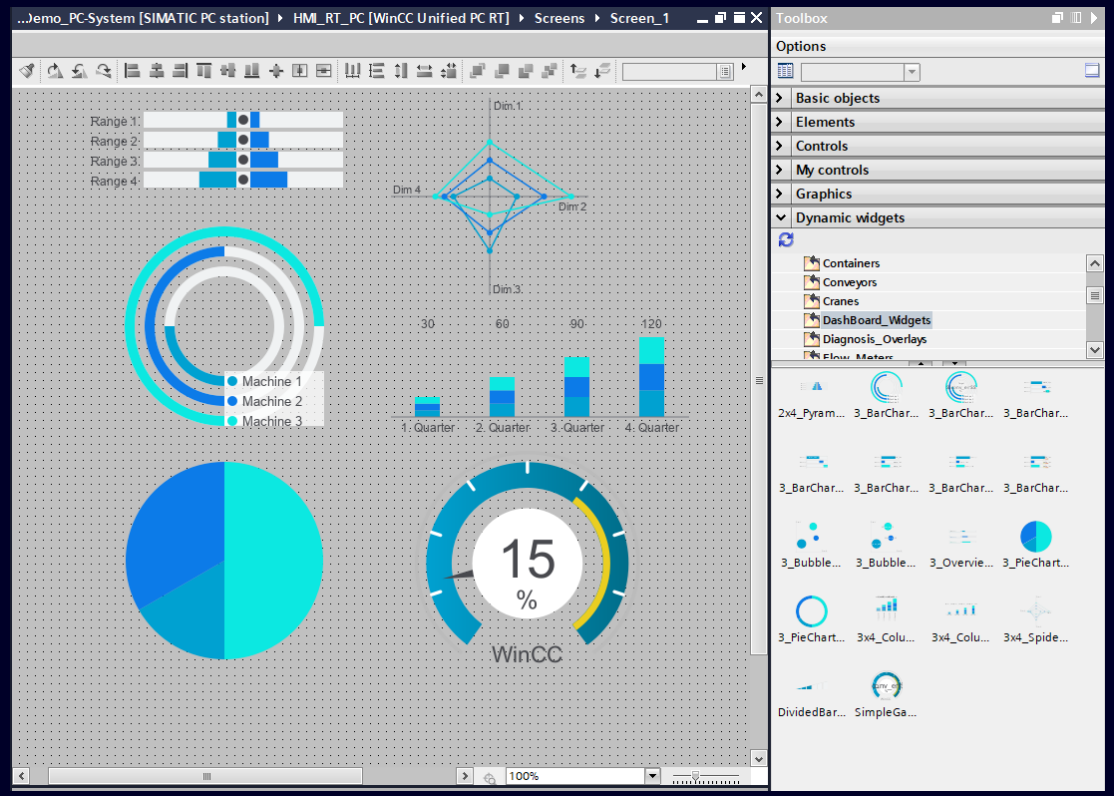
Editing SVG with external program

- External editor for SVG files can be used for editing directly from TIA Portal
- 'Edit' is available on the context menu for SVG objects in Graphics, Graphic Lists, and Graphic types (Library)

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WinCC Unified V20 - Engineering Efficiency
Widgets - new dynamic widgets available

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



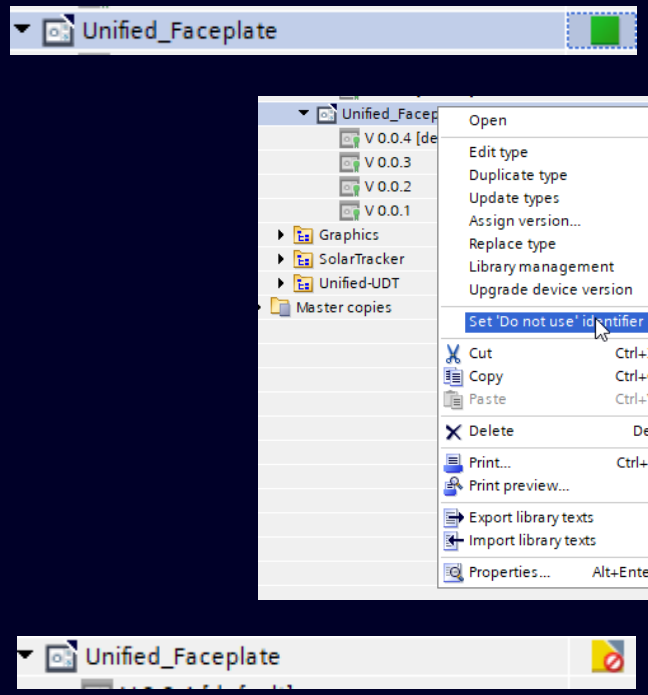
New set of Dynamic Widgets (Dynamic SVGs)

- New Dynamic Widgets delivered with TIA V20 to organize, analyze and visualize information by showing relationships and categories
  - Circular bar charts
  - Bar charts
  - Stacked bar charts
  - Bubble charts
  - Pie charts

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WinCC Unified V20 - Engineering Efficiency
Library – Disable use of Faceplate Types

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Faceplate can be set with a “Do not Use” Flag

Disable the instantiation of faceplates in the Global Library for a further use in a project

Mark a faceplate not to be used as it is “obsolete” or should be a “template” faceplate.

- If flag is set the instantiation of faceplate in screen is not possible
- Only duplicate, modify and instantiate the duplicate

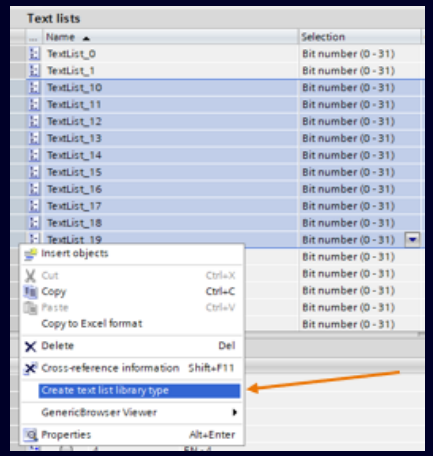
Info:
Valid only for Unified devices

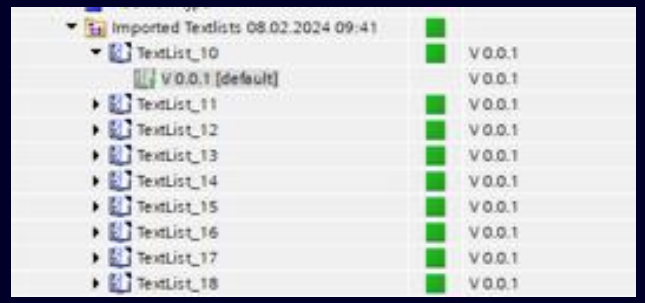
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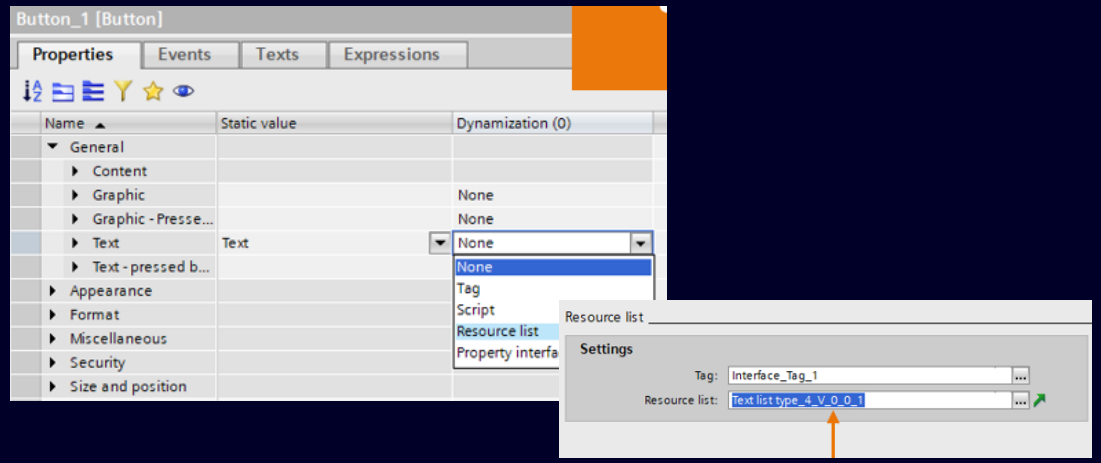
WinCC Unified V20 - Engineering Efficiency

Library – Create library types from project & use text list types in faceplates and screens

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







Creating library types out of existing project items like text lists to save time and manage a workflow

Create library types from your project via context menu with single- and multi-selection support of

- Text lists
- Graphics
- Script Modules

Configure a text list from your project library in faceplates or screens

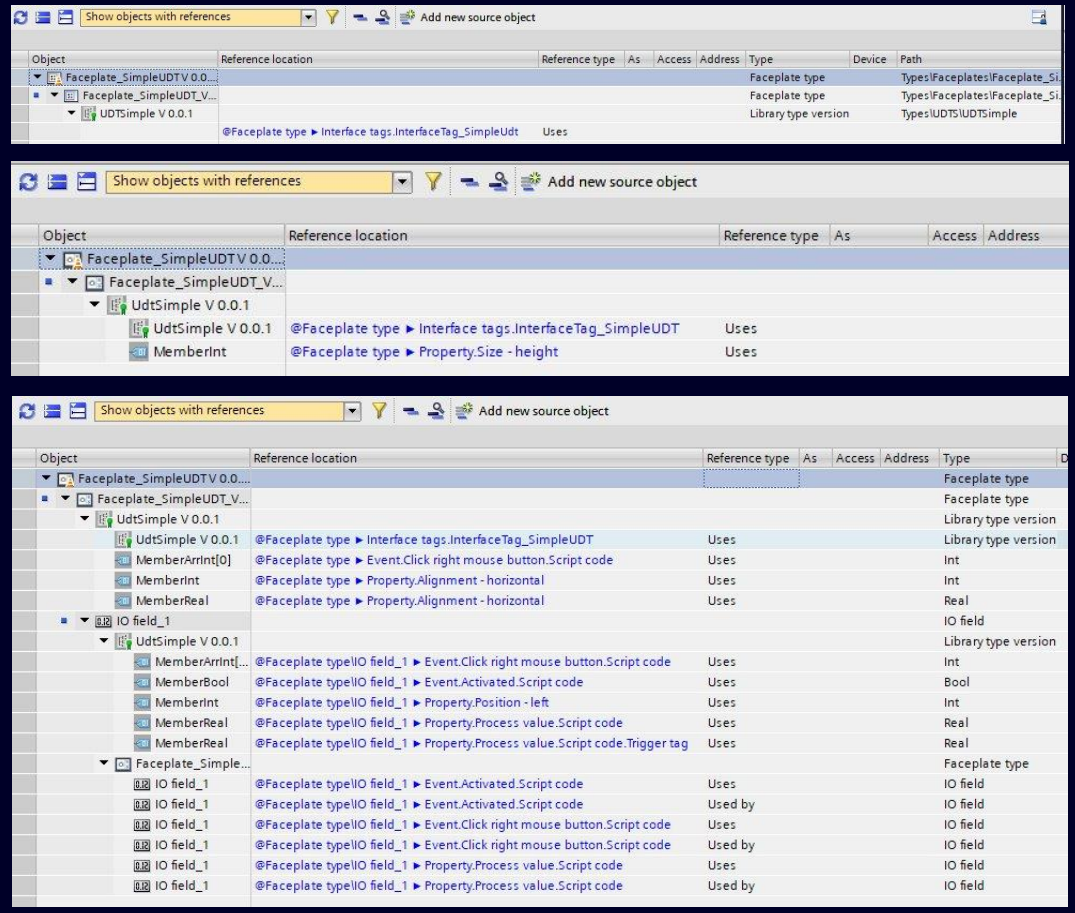
Two steps are necessary at a text property:

1. Select Resource list as the Dynamization
2. In the Setting select a Tag as an index and pick the version of the resource list

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WinCC Unified V20 - Engineering Efficiency
Library - identify cross references

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Cross Reference for PLC UDT in Unified Faceplates

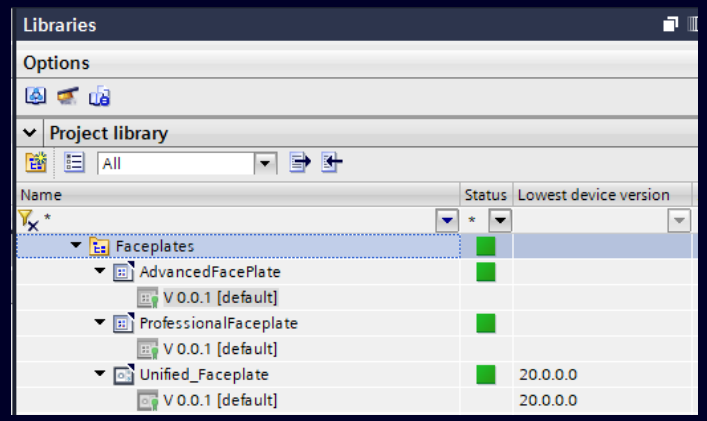
- Cross reference shows PLC UDT used at interface tag in Unified Faceplates
- PLC UDT used in tag or script dynamization, or on at event function lists and event scripts are shown in cross reference views
- Screen items of Unified Faceplates which are using PLC UDT member are shown in cross reference view

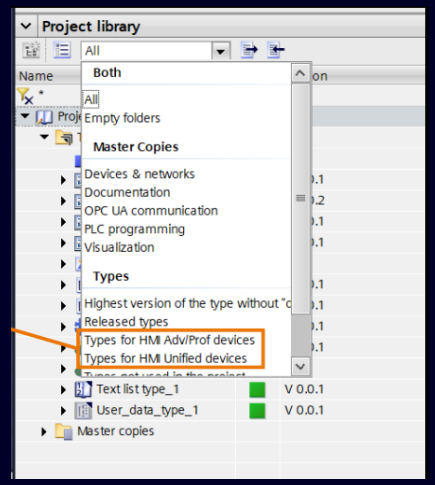
→ Using cross reference for PLC UDT and Unified Faceplates saves a lot of time!

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WinCC Unified V20 - Engineering Efficiency
Library - Identify and filter Unified library types (Faceplates)

Unified Basic Panel	Unified Comfort Panel ✓	WinCC Unified PC ✓





Immediately identify Unified Faceplate from non-Unified Faceplates

Fast distinguish between different device types, if you configure or migrate





- Unified Faceplates are displayed with the icon
- Non Unified Faceplates are displayed with the icon

The library view can be filtered between Unified types and Adv/Prof types

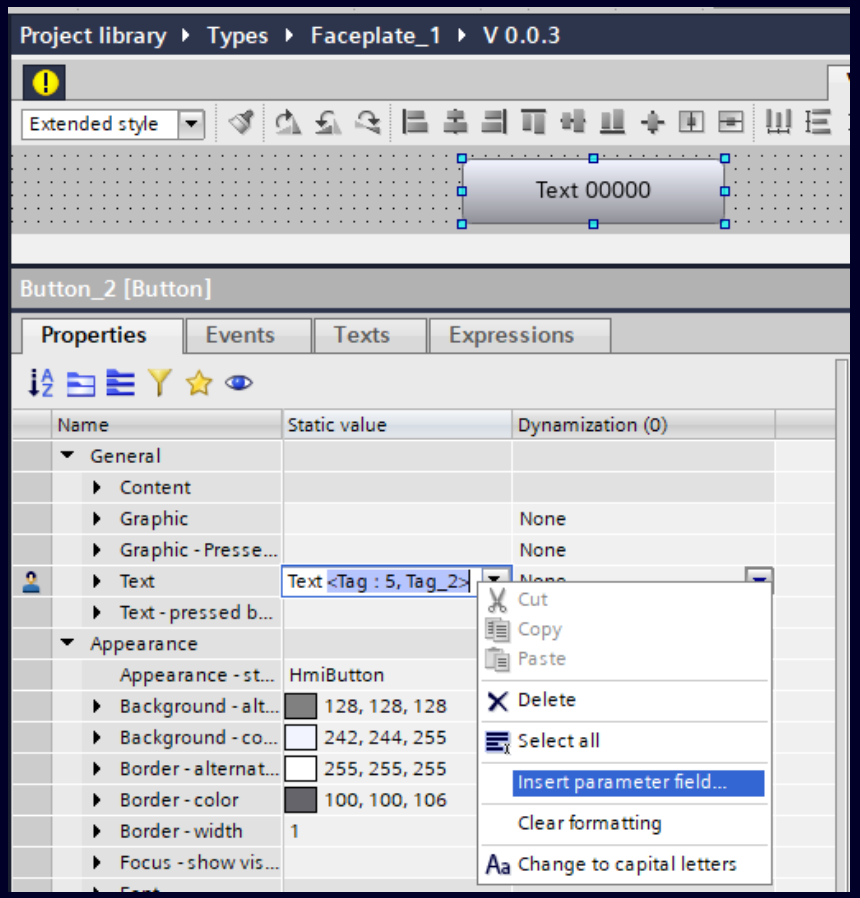
- See only types which can be use on a Unified device
- See only types for an Adv/Prof device
- See all

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WinCC Unified V20 - Engineering Efficiency
Faceplates - Formatted Texts for Text Properties of Screen Items in Faceplates

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Format Texts inside faceplates with parameter tags via context menu

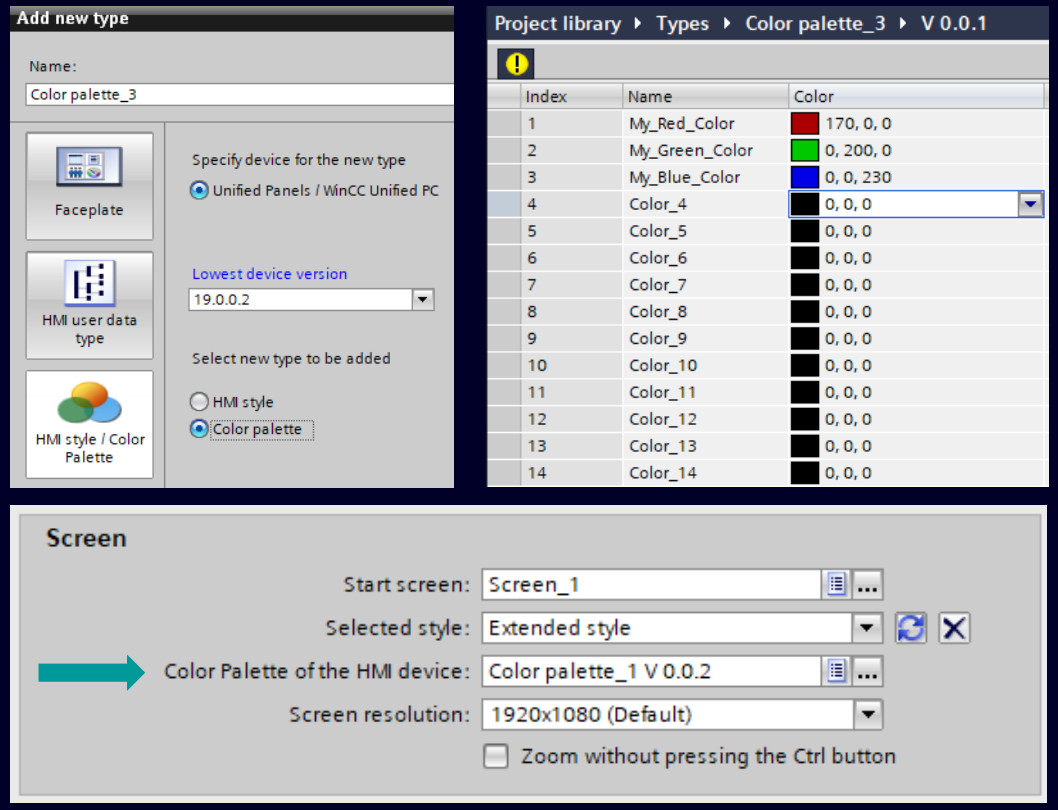
- Static texts can be formatted now as usual in screens
- Insert parameter fields with Tags value support
- No support for textlist based parameter fields

→ Format texts supports efficient engineering without the need of scripts in faceplates

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WinCC Unified V20 - Engineering Enhancements
Standardization | Central color palette – as library object

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Define and update colors centrally [1]

Color Palette as new Library type

- 500 named colors can be configured
- Works as a standard library type

Configuration for a device

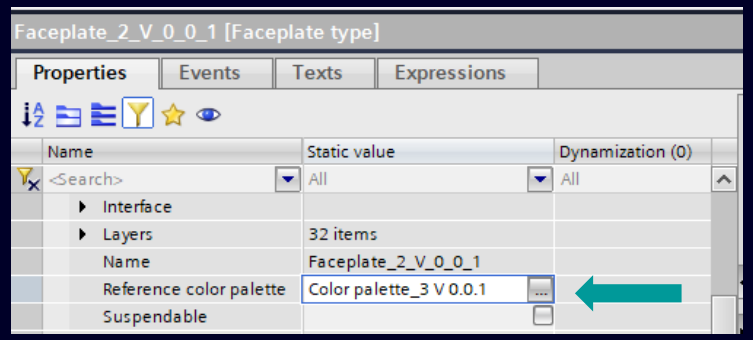
- Assign to a device in Runtime settings

1 Since V19 Update 2 the feature is available in scripts including faceplates.

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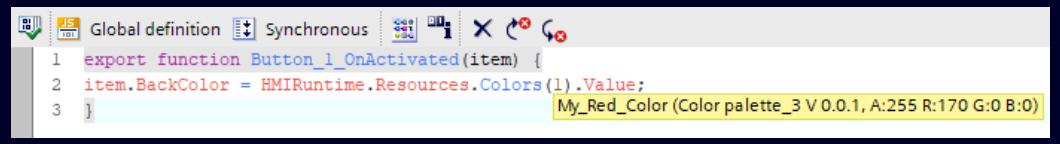
WinCC Unified V20 - Engineering Enhancements
Standardization | Central color palette – usage via scripting including faceplates

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



New with V20





Define and update colors centrally [1]

Configuration for a Faceplate

- Assign to a Faceplate Type ←

  Hint: Works as a preview.

Color Configuration in scripts

- Configure colors by index from the assigned Color Palette via NEW object picker

  Hint: There is a tooltip to display Color Palette and detailed color information as well.

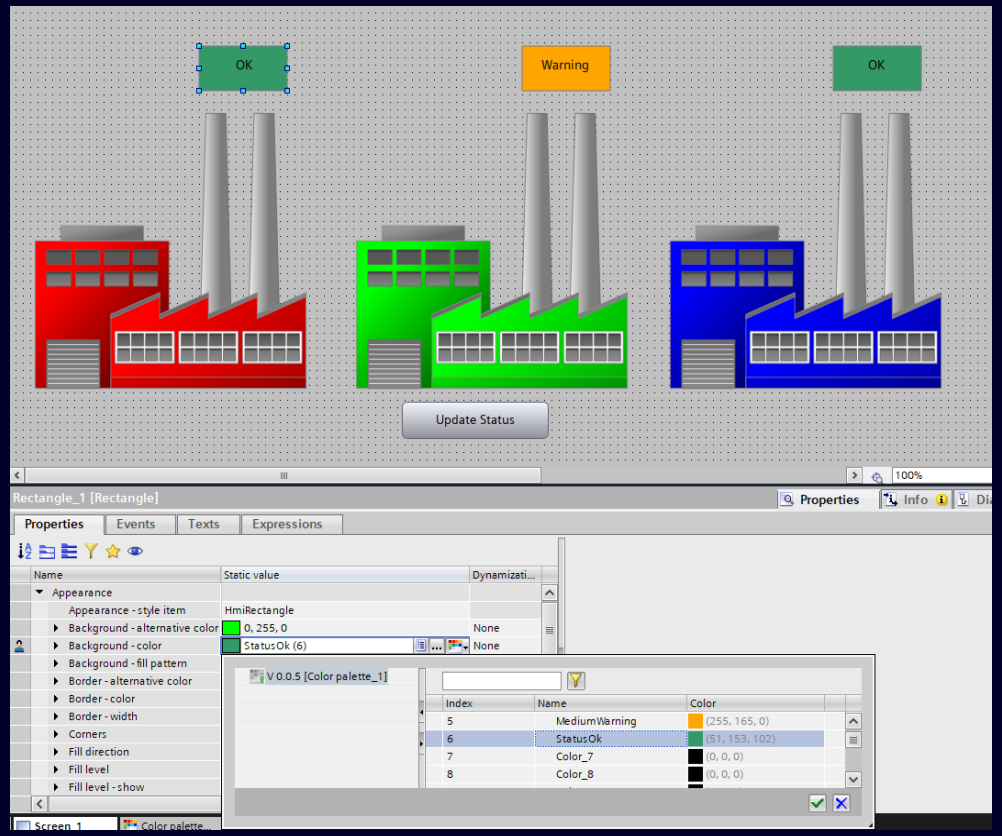
1 Since V19 Update 2 the feature is available in scripts including faceplates.

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WinCC Unified V20 - Engineering Enhancements

Standardization | Central color palette – usage for screens/screen items including faceplates

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



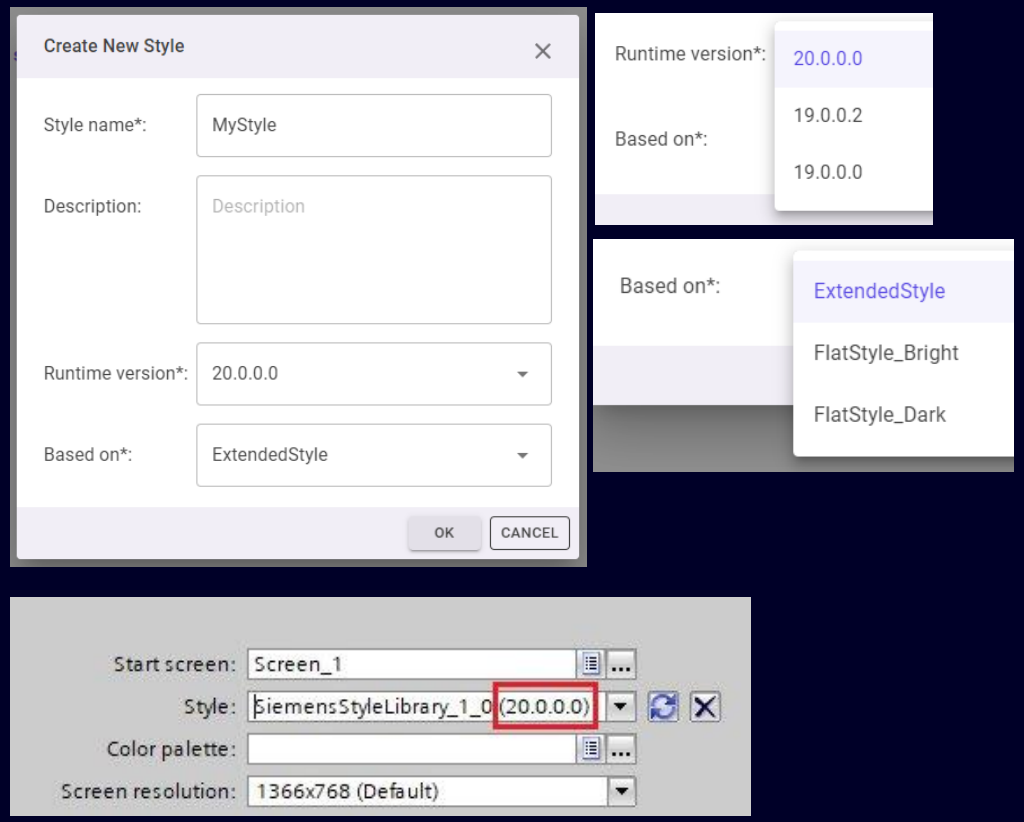
Configure colors via object picker for color properties

- Static properties (Top level and Embedded)
- Dynamics (Tag and Flashing)
- Expressions
- Interface properties
  - Custom properties of Dynamic SVG's (incl. Library)
  - Faceplate interface properties of a Faceplate instance
  - Custom control properties
  - Collected properties of contained items of a Group
- Faceplate properties (All properties from above)

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WinCC Unified V20 - Engineering Efficiency
Corporate Designer – Target device version for custom styles

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Corporate Designer – Target device version for custom styles

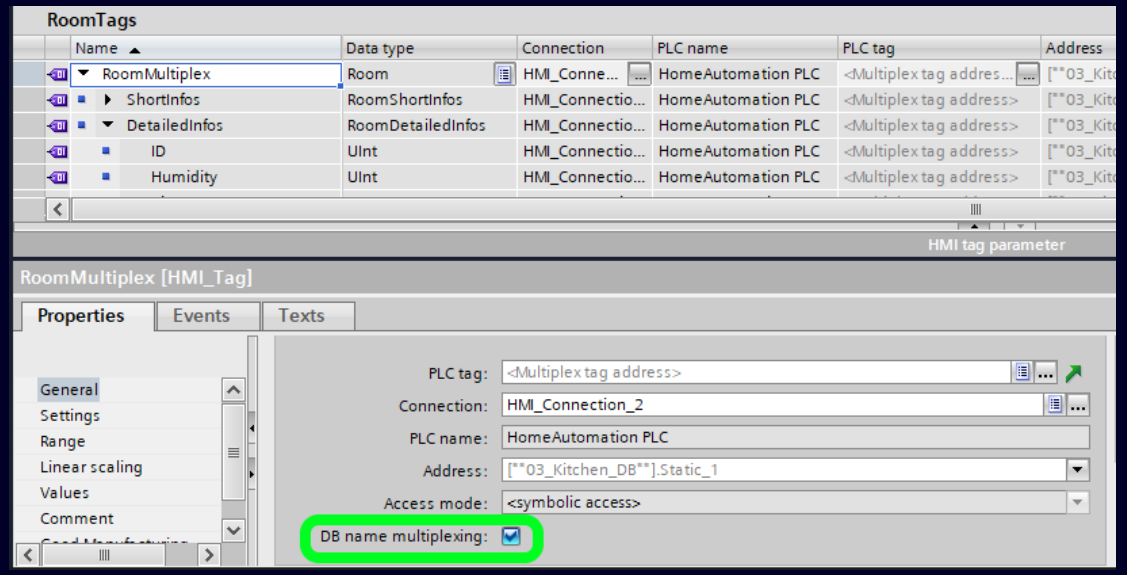
- Multiple versions of custom styles can be created
  - .cd19 for V19 devices
  - .cd19_0_0_2 for V19 Upd2 devices
  - .cd20 for V20 devices
- The version of existing custom styles can be changed
- If a non-matching style remains selected after a project upgrade, the user is informed by a corresponding compile error
- The version matching custom styles are automatically selected after device change

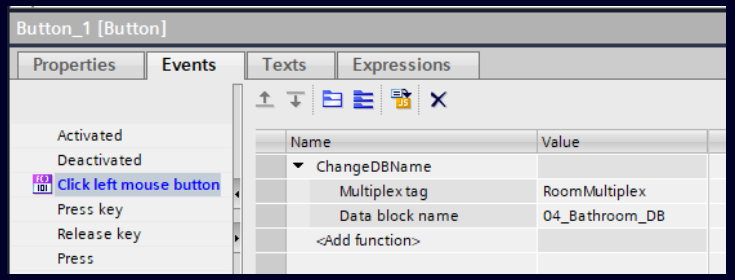
→ Available via SIOS #109824234

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WinCC Unified V20 - Connectivity
Multiplexing - Data Block Name Multiplexing

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓







Extends the Address Multiplexing capabilities by making the Data Block Name selectable

A new way to access identical structured PLC Data

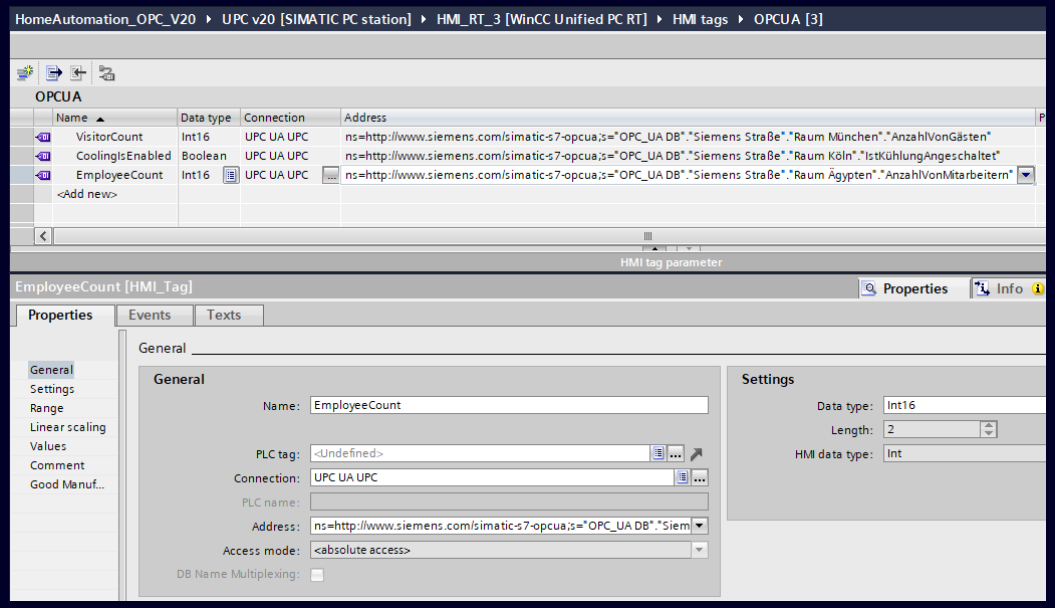
- HMI Tag needs to reference a PLC tag of one Data Block only
- Support for Data Blocks inherited from FBs or PLC UDTs with symbolic access
- Use a System Function to change the Data Block Name of the tag in Runtime
- Additional electronic record for Audit Trail
- Starting from V20 the configuration can be done via Excel or Openness import

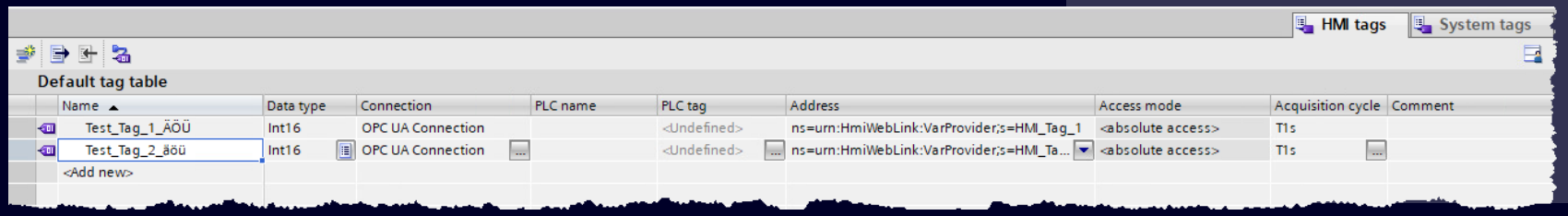
as of V19 Update 2

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WinCC Unified V20 - Connectivity
OPC UA - Using umlaut in the address of an OPC UA

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Customer can use a Tag with special characters as umlaut (Ä, Ö, Ü) in the address from an OPC UA Server

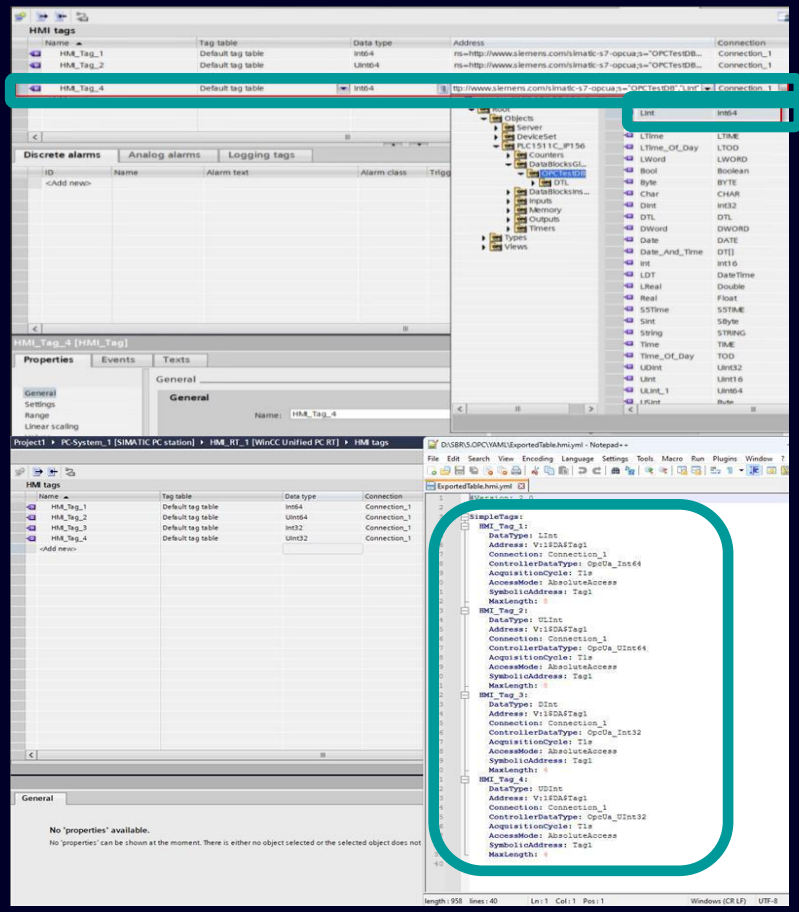
easily access tags with umlauts in their nodled address names without having to edit the name of each affected tag.

- Supported are all Unicode Characters, except the Unicode Control Characters.

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WinCC Unified V20 - Connectivity
OPC UA Client - LInt64 and ULInt64 Datatype Support for OPC-UA

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



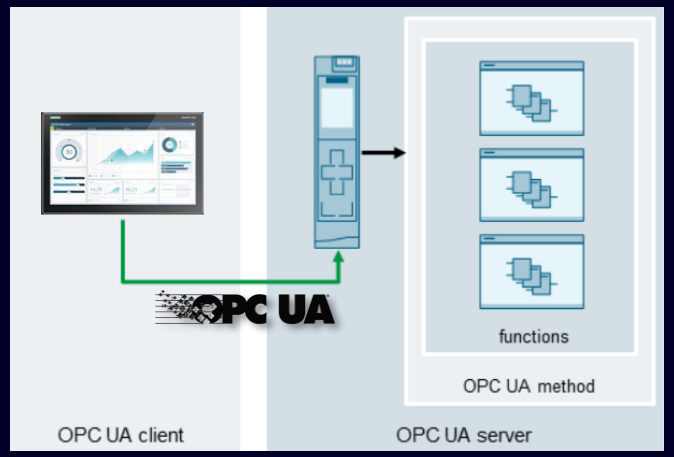
OPC UA Client – Data Access

- OPC-UA Client DA now supports LInt64 and ULInt64 datatypes for communication in V20 and above devices only.
- These datatypes can also be imported/exported for OPC-UA Communication Driver via Excel or via Openness for V20 devices

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WinCC Unified V20 - Connectivity
OPC UA Client - Methods

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓




```
const methodPath = [{
  "Name": "Objects"
},{
  "Namespace": "urn:MyOpcUaTestServer:TestNodeManager", "Name": "TestMethods"
},{
  "Namespace": "urn:MyOpcUaTestServer:TestNodeManager", "Name": "MethodTwoArgs"
}];
let method = await connection.Session.GetMethod(methodPath)
.catch((error) => {
  let errorMsg = HMIRuntime.GetDetailedErrorDescription(error);
  HMIRuntime.Trace(`Accessing method failed with error: ${errorMsg}`);
  return;
});

if (method.Status != 0)
{
  HMIRuntime.Trace(`Accessing method failed with error: ${method.ErrorDescription}`);
  return;
```

OPC UA Client - Methods

You have the option of reading or writing tags from the OPC UA server, now even complex function sequences can be started via OPC UA

- Method calls are a fundamental part of the OPC UA specification. Methods are comparable to the Remote Procedure Calls (RPC) long known in computer science. They offer the possibility of efficiently executing RPC calls in the automation world and thus reduces the classic handshake patterns for communication between devices.

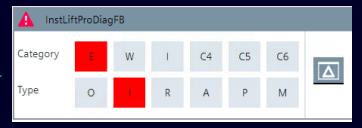
as of V19 Update 2

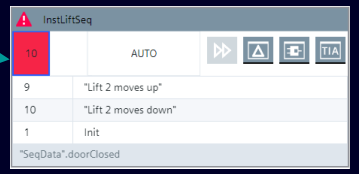
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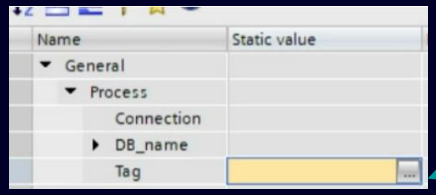
WinCC Unified V20 - Analysis & Operations
Process Diagnostics – change connection of overview controls

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✓

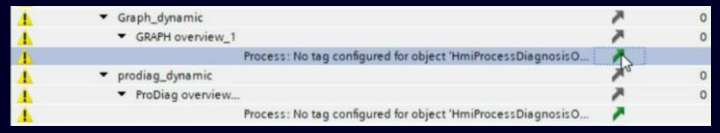
Change connection for ProDiag Overview and GRAPH Overview dynamically in RT.







In ES static connection configuration is no longer enforced.



In RT change connection via Script.

```
HMIRuntime.UI.FindItem('GRAPH overview_1').SetProcessConnection("PLC1_F", "GraphViewer_US079_LAD_DB");
```

SetProcessConnection(String PLCName, String Block)

Change Connection of Process Diagnostic Overview Ctrls

Overview Control connection can be changed at runtime to view information of another PLC / Instance DB instead of static configuration only.

- Supported for Overview Controls
  - Graph overview
  - ProDiag overview
- Dynamize the connection for the overview controls via JavaScript
  - PLC name
  - DB name to be visualized

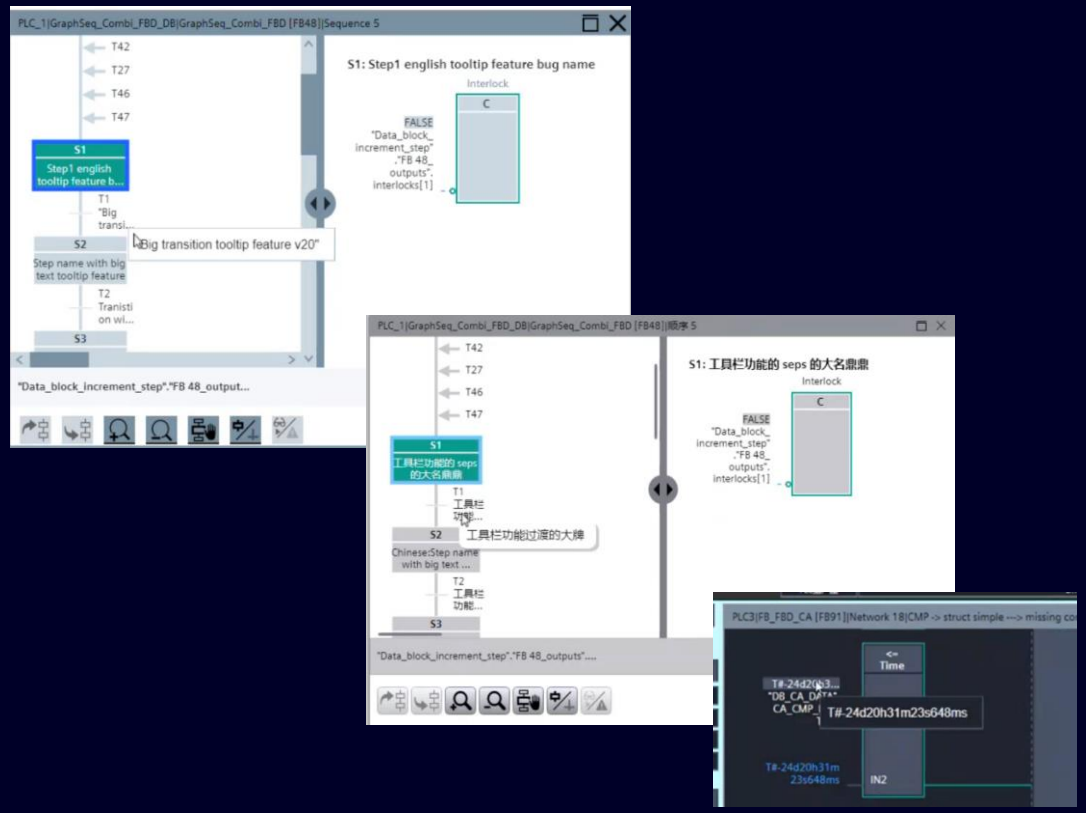
as of V19 Update 2

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WinCC Unified V20 - Analysis & Operations
Process Diagnostics – PLC Code View – Tooltip texts for abbreviated texts

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓



Tooltip texts for abbreviated texts in PLC Code View

To see full text of abbreviated texts in PLC Code View, mouse hover and long touch press show full text in a tool tip text.

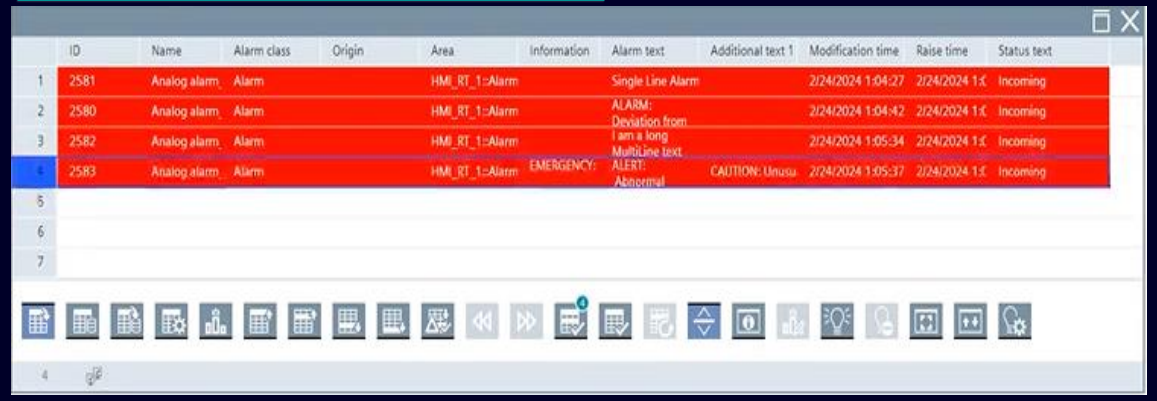
as of V19 Update 2

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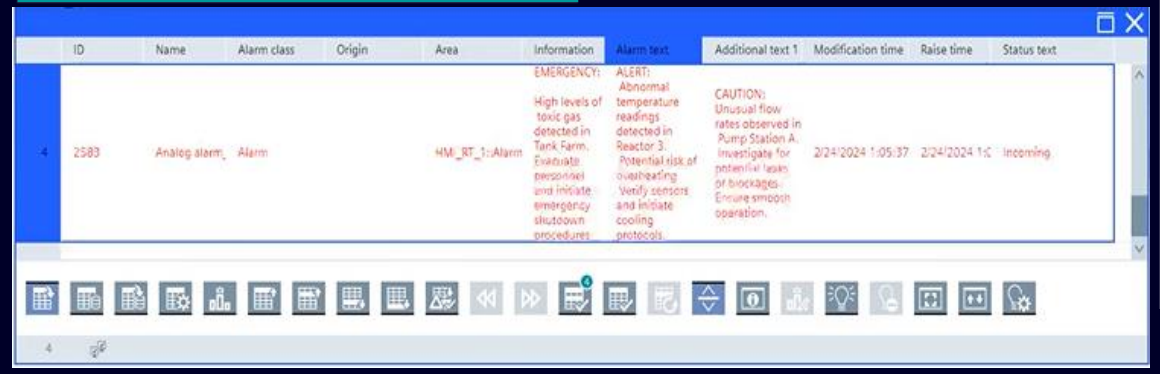
WinCC Unified V20 - Engineering Enhancements
Alarm Control enhancements – multiline of alarms

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

Alarm control before automatic line break



Alarm control after automatic line break



Alarm Control - support of automatic multiline text

Alarm texts that are too long to be displayed in its column are automatically wrapped, so that the entire text can be read

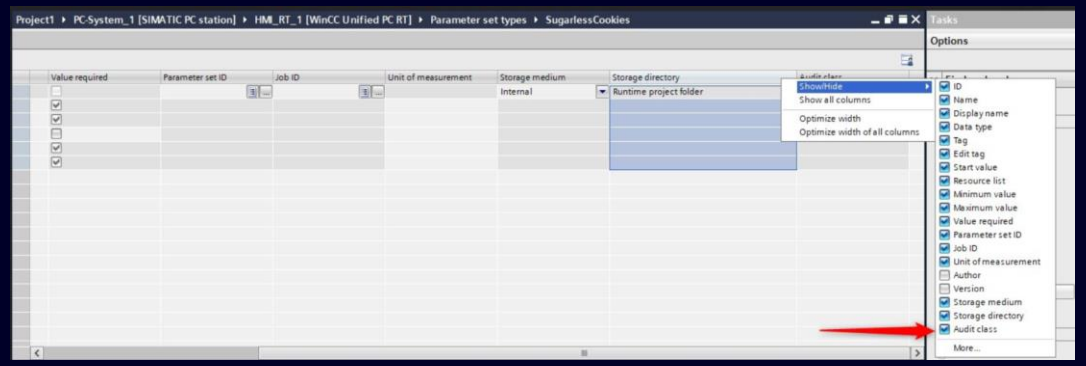
- Text wrapping is supported for the following columns of Alarm - Information, Alarm Text & Additional Text 1 to 9
- In TIA Engineering while selection mode is set to "Single."
- When column with Alarm text configured with lengthy text is selected, Alarm text will be wrapped to fit in the increased row height.

as of V19 Update 2

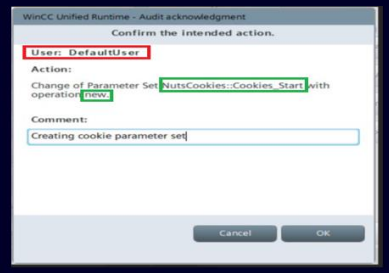
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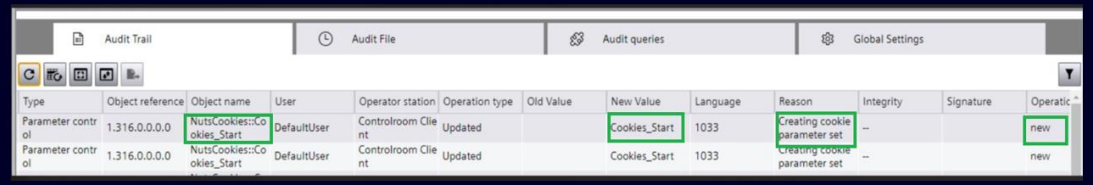
WinCC Unified V20 – Option Audit
Audit – Support for PaCo

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓









Enhanced Parameter Control to support Audit functionality to record all paco operations

Track changes of the parameter control in order to support GMP requirements

- Control operation being tracked:

  Create **Save** **SaveAs** **Rename** **Delete**
  WritePLC **ReadPLC** **Import** **Export**

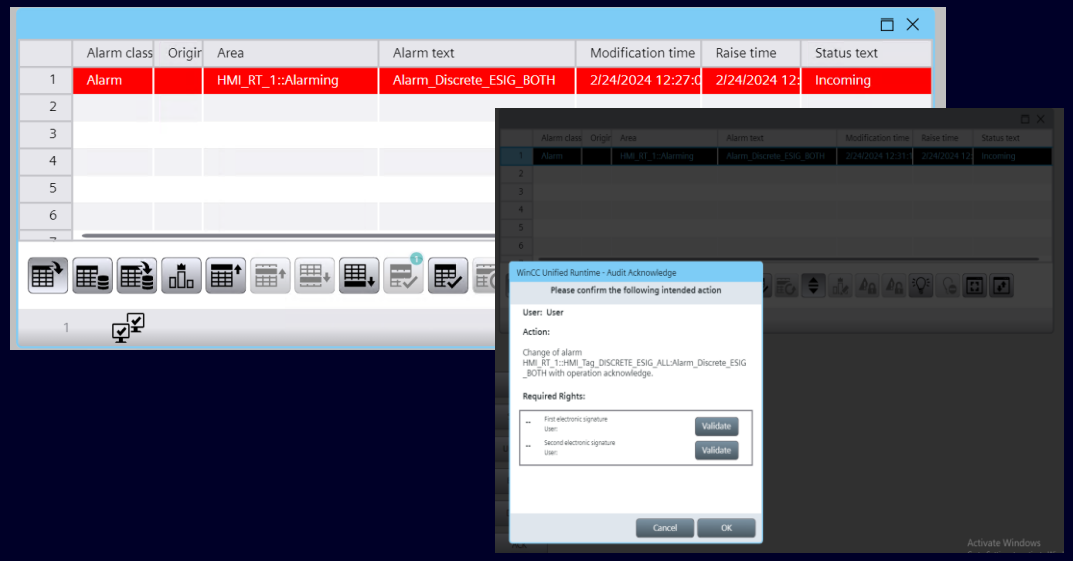
- System functions operation being tracked:

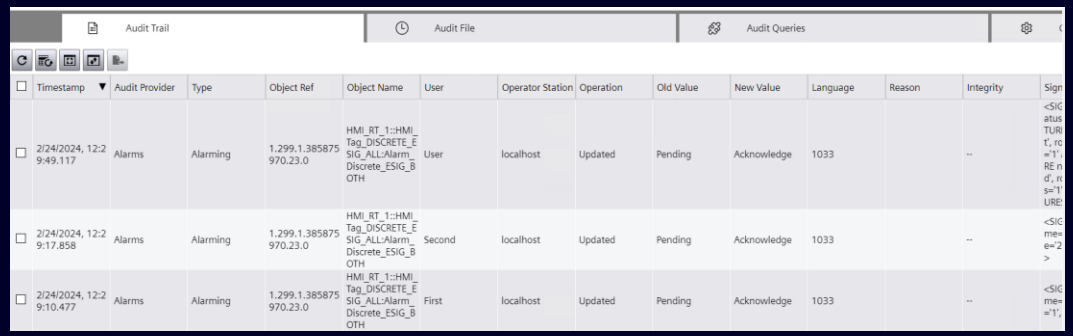
  ReadAndSaveParameterSet
  ImportParameterSets
  ReadParameterSet
  CreateParameterSet
  LoadParameterSet
  RenameParameterSet
  LoadAndWrite
  LoadAndWriteParameterSet
  ExportParameterSets
  WriteParameterSet
  SaveParameterSet
  DeleteParameterSet
  ReadAndSave

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WinCC Unified V20 – Option Audit
Audit – Electronic records for user related alarm changes

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Generation of electronic records for user related alarm operations

Discrete and Analog alarms can be configured for GMP relevant operation changes: acknowlege, shelve, unshelve.

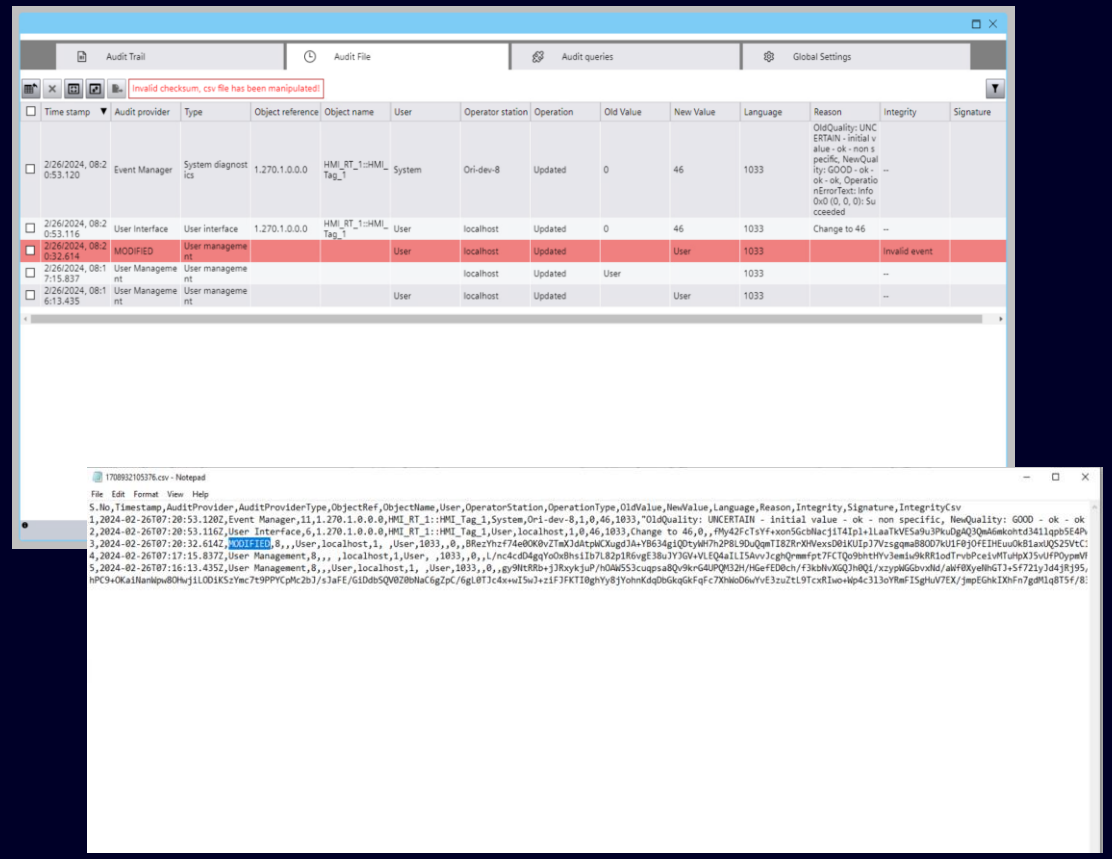
- Configuration based on Audit classes to reduce engineering effort
- Alarm control operations related to GMP relevant alarms are managed by Audit: suporting tracking, confirmation and ESIG.

as of V19 Update 2

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WinCC Unified V20 – Option Audit
Audit – Manipulation detection on audit files

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Export/Import of audit files are checked against manipulation

Exported files from Audit Viewer contains a manipulation check based on generated Audit certificate

- On import audit files into the Audit Viewer, electronic records are validated against the corresponding Audit certificate to identify potential manipulations

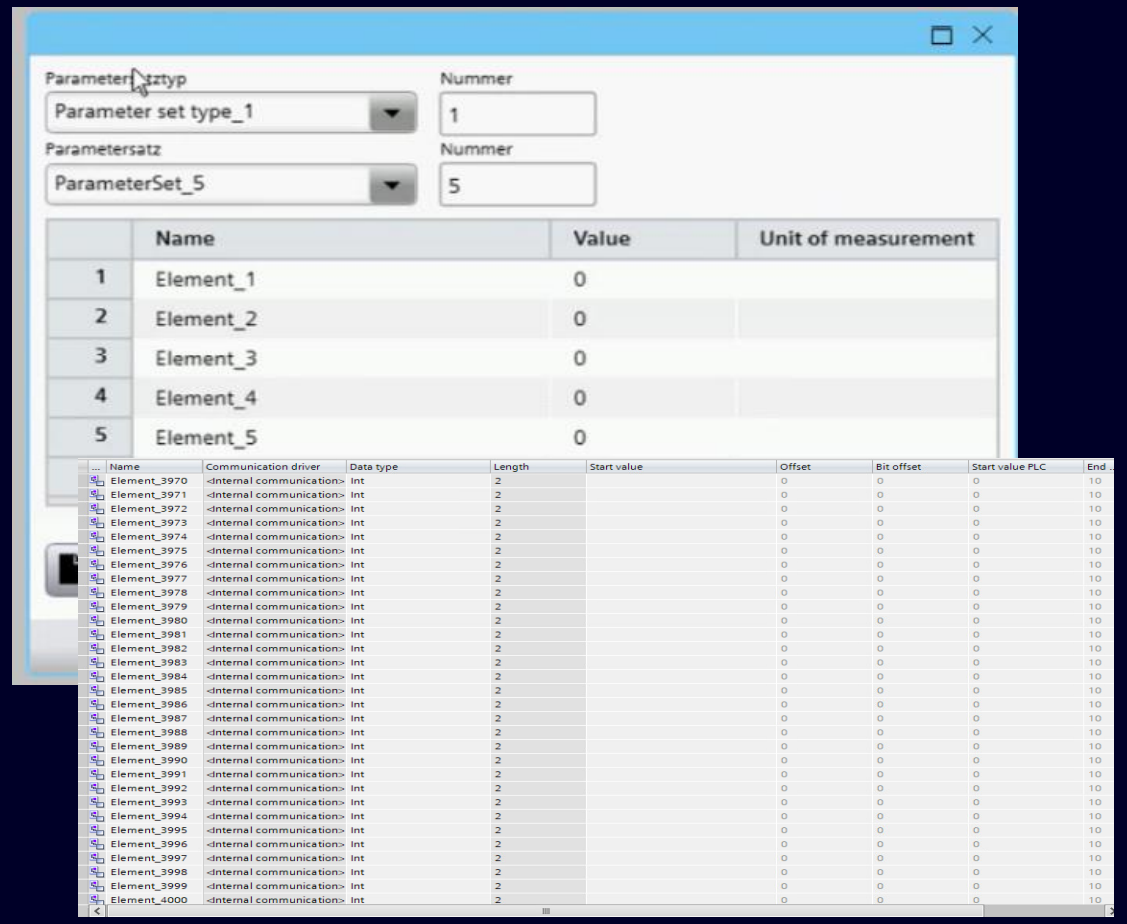
as of V19 Update 2

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WinCC Unified V20 – Option Parameter Control

Parameter Control – Extended number of Parameter Set Type elements

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Enhanced ParameterSet functionality with support from 1,000 to 4,000 elements

All the PaCo operation are extended to support for 4000 elements

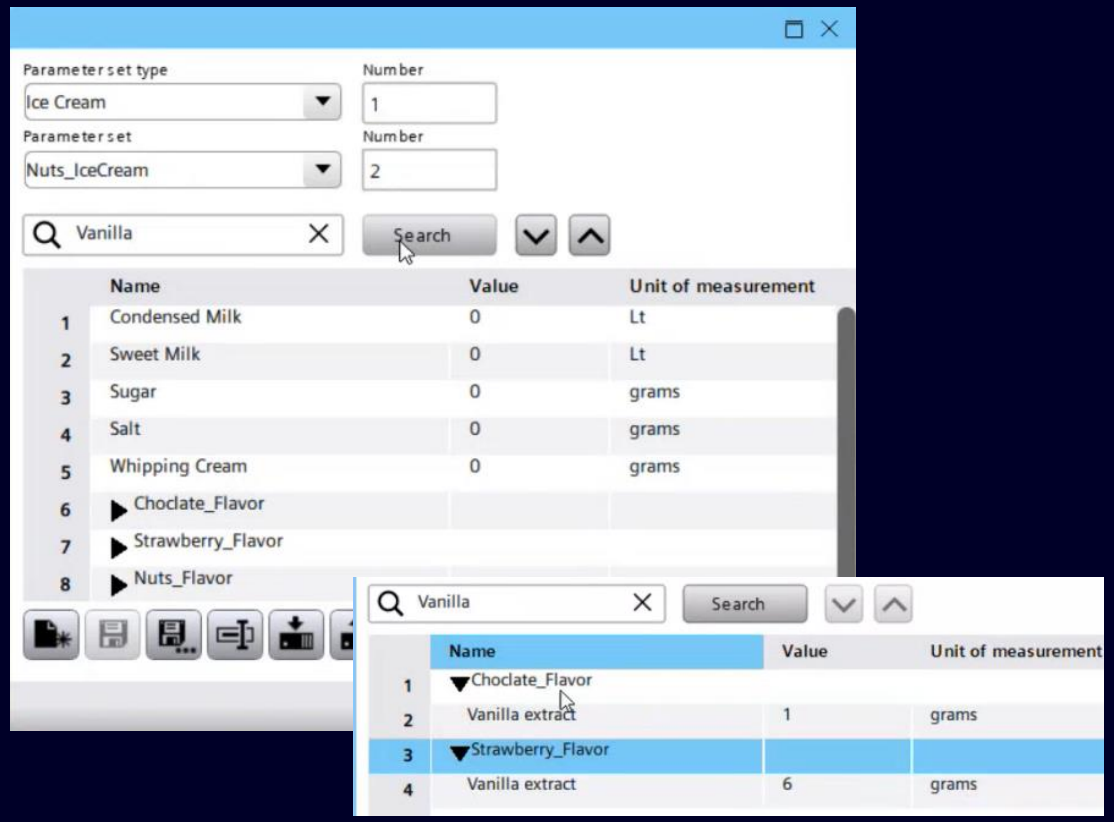
- Parameter control view
- System Function
- Scripting
- Control Tag

as of V19 Update 2

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WinCC Unified V20 – Option Parameter Control
Parameter Control – Search / Filter Support for PaCo Control

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Enhanced Parameter Control view to easy user of find elements and performing operation in the view better

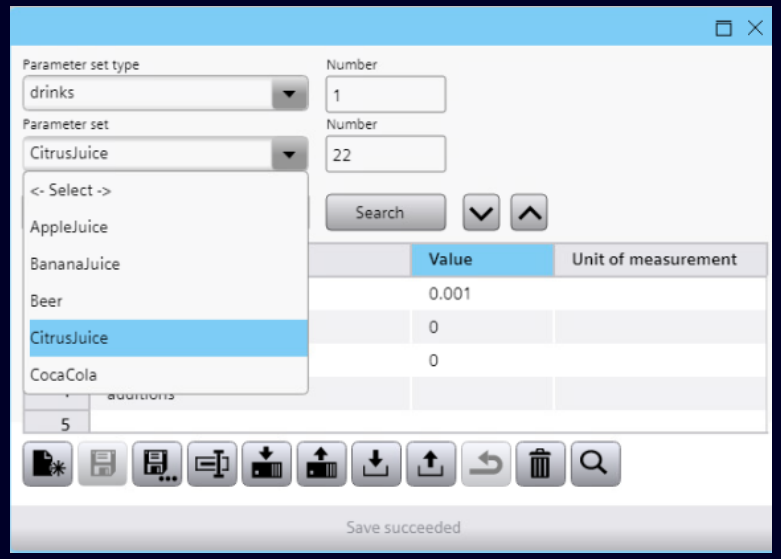
Search parameter set elements of a recipe to find easily specific elements in a huge parameter set

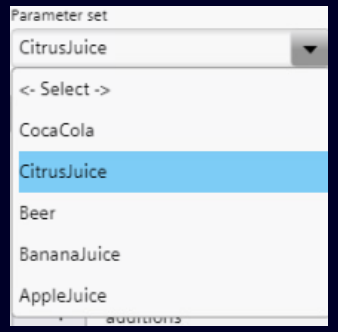
- Display or hide the search field via a separate toolbar button
- Search for elements in nested UDT structures

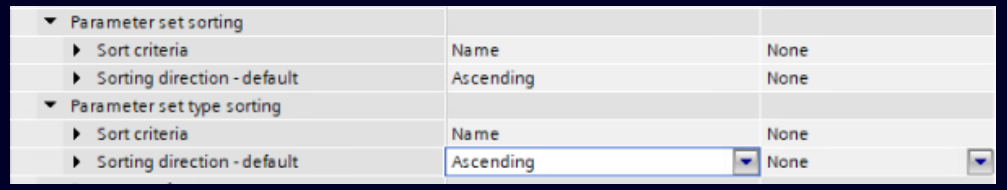
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WinCC Unified V20 – Option Parameter Control
Parameter Control – Sort support for PaCo Control

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







Enhanced Parameter Control to support Parameter Set Type and Parameter Set level sorting based on the ID and Name

Sort parameter set types or parameter sets

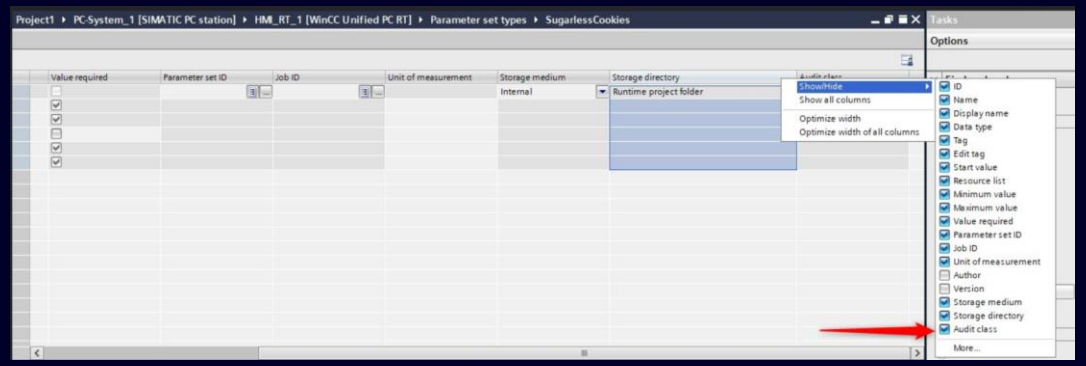
- Pre-defined in Engineering
  - Sort criteria: Name or ID of parameter set / type
  - Sorting direction: Ascending or Descending
- Sorting can be changed at runtime
  - Change sorting during runtime via SystemFct
    "SetPropertyValue" or via Enumeration in Scripting:
    HMIRuntime.UI.Enums.HmiSortDirection.Ascending

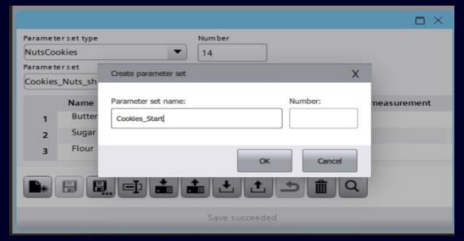
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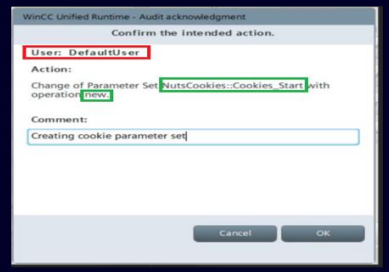
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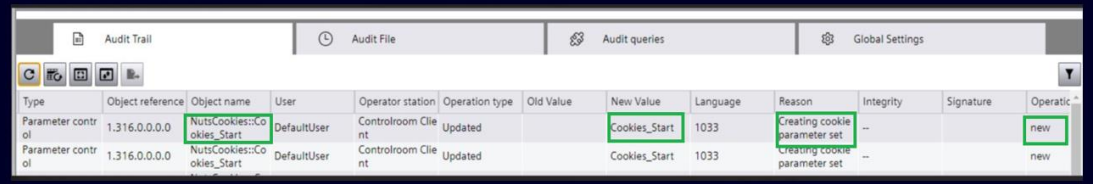
WinCC Unified V20 – Option Parameter Control
Parameter Control – Audit Support for PaCo

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓









Enhanced Parameter Control to support Audit functionality to record all paco operations

Track changes of the parameter control in order to support GMP requirements

- Control operation being tracked:

  Create **Save** **SaveAs** **Rename** **Delete**
  WritePLC **ReadPLC** **Import** **Export**

- System functions operation being tracked:

  ReadAndSaveParameterSet
  ImportParameterSets
  ReadParameterSet
  CreateParameterSet
  LoadParameterSet
  RenameParameterSet
  LoadAndWrite
  LoadAndWriteParameterSet
  ExportParameterSets
  WriteParameterSet
  SaveParameterSet
  DeleteParameterSet
  ReadAndSave

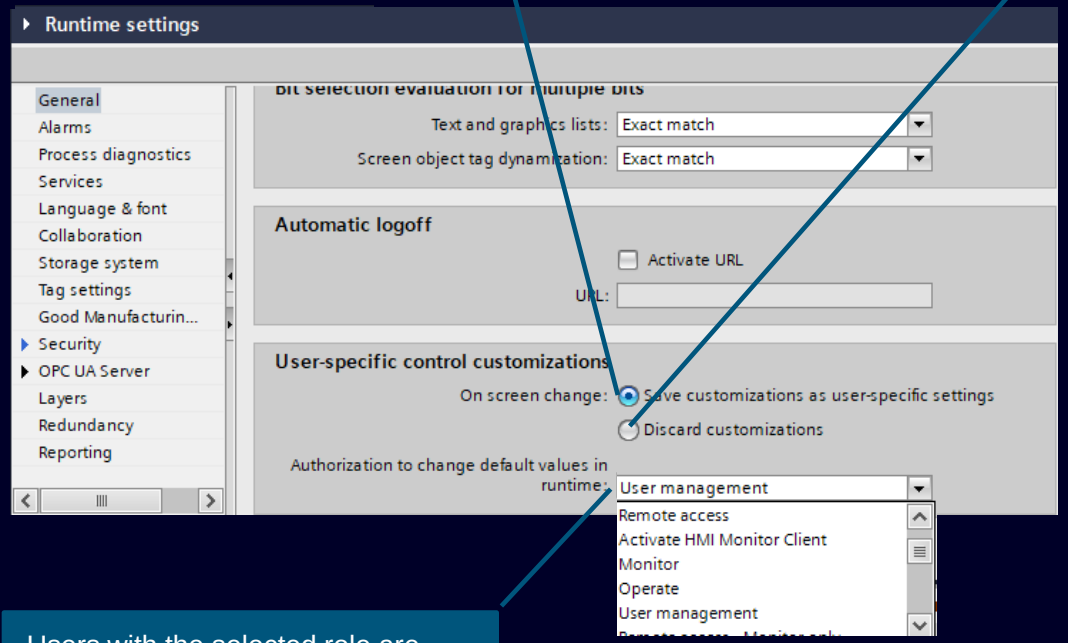
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WinCC Unified V20 – Personalized UI
Persistency of control settings

Unified Basic Panel ✗	Unified Comfort Panel 🛠	WinCC Unified PC ✓

On screen change, the control settings are persistent automatically

On screen change, the control settings are withdrawn



Users with the selected role are able to set new default settings for controls

Retain of changed controls settings while switching the screens during runtime and session over spanning

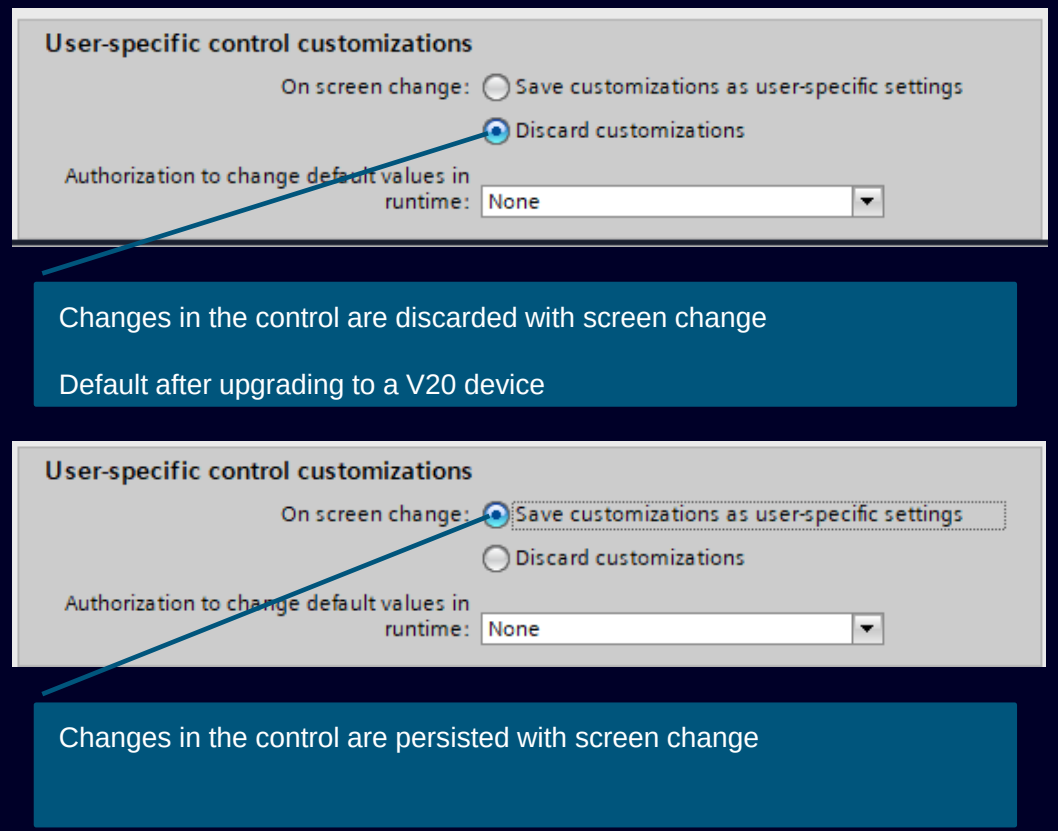
- User specific personalization of controls in a screen
- Enable the persistency of changed Control settings (Alarm Control, Trend Control and Function Trend Control) at TIA portal on device level
- Persistency can be set Automatically
  - Save the current personalized setting on screen change
  - Discard the user settings on screen change
- Persistency can be stored
  - Personalized by every user
  - Globally (as new default) by users with a selectable role
- Persistency can be reset as defined at engineering

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WinCC Unified V20 – Personalized UI

Persistency of control settings at screen change – persistency on screen change

Unified Basic Panel ✗ | Unified Comfort Panel 🛠 | WinCC Unified PC ✓



Enable retain of changed settings while switching the screens during runtime for controls within a screen

- Enable / disable the persistency “on screen change” at TIA portal on device level
- At runtime, a change of a control setting as positioning, size and control specific setting are kept after switching the screens and going back
  - The settings are stored user specific
  - Available for Alarm Control, Trend Control and Function Trend Control
  - The setting is “stored” for the control within this screen

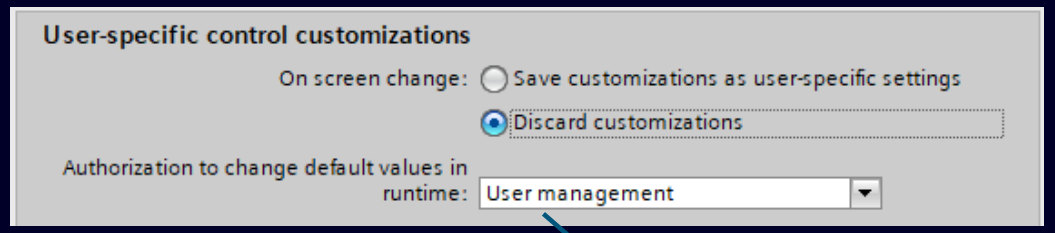
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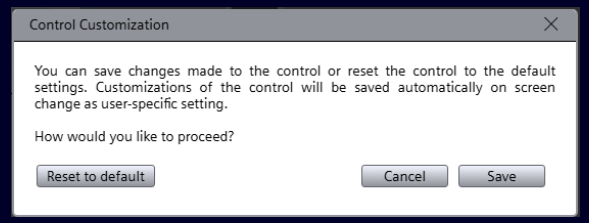
SIEMENS

WinCC Unified V20 – Personalized UI

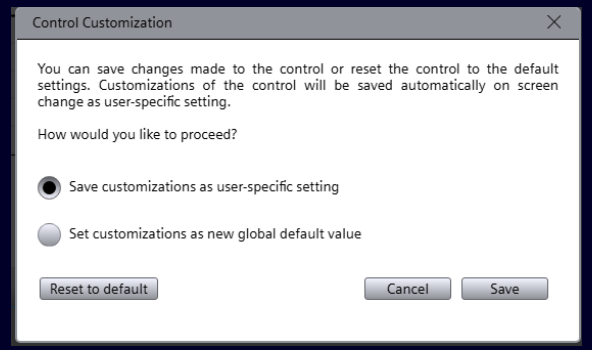
Persistency of control settings at screen change – define a new default setting

Unified Basic Panel ✗	Unified Comfort Panel 🛠	WinCC Unified PC ✓





User without assigned right is able to save a user specific setting by pressing



User with assigned right is able to save a new global or user specific setting by pressing

A reset to default pre-engineered settings is possible

Define new global or user specific control settings

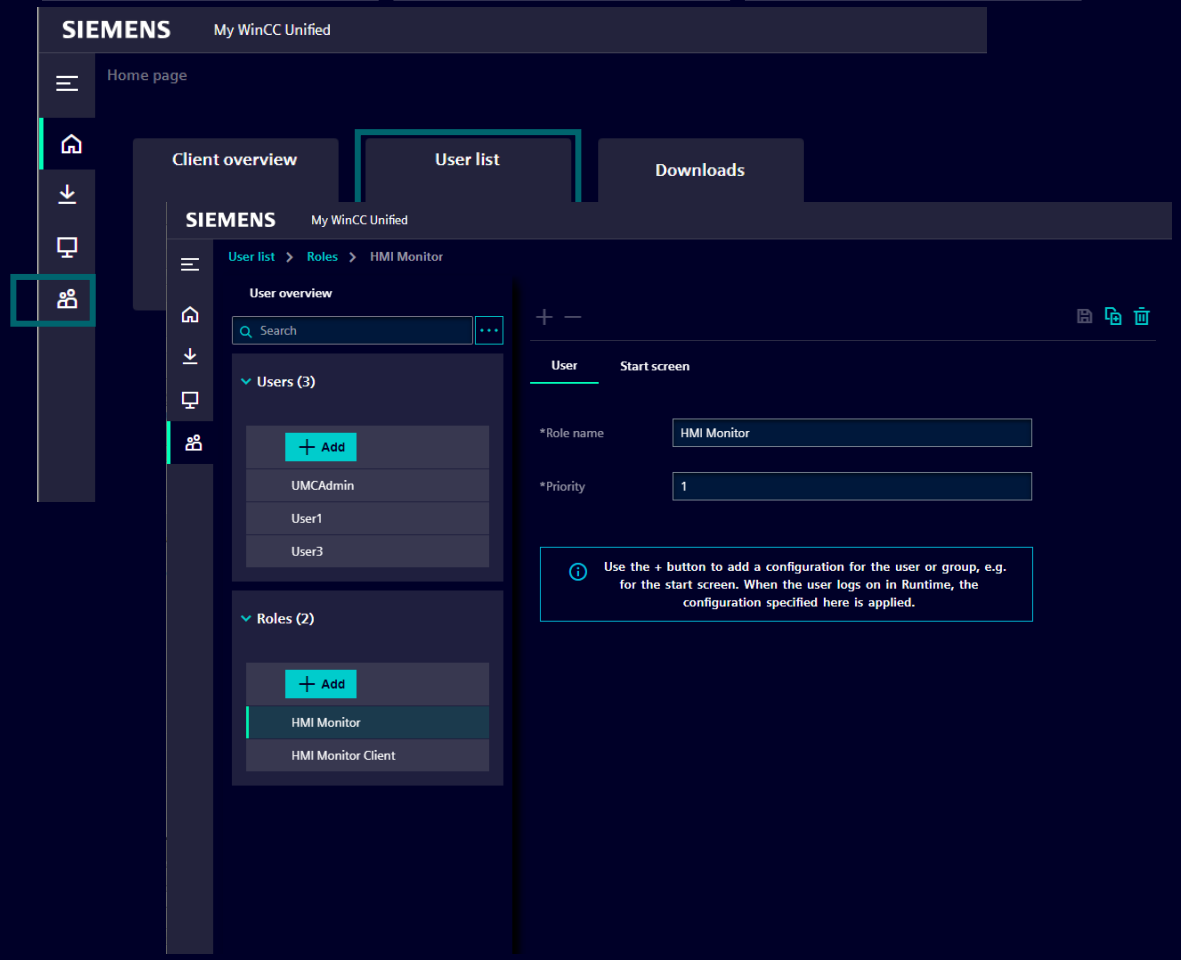
- Manual definition of changed setting of a control (Alarm Control, Trend Control and Function Trend Control) by executing a control function (user profile settings)
- Definition of new user specific control setting available for users without certain rights
- Definition of new global control settings available for users with pre-defined function rights

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WinCC Unified V20 – Personalized UI
Unified Station Configurator – User and Role specific Start screen

Unified Basic Panel ✗ | Unified Comfort Panel 🛠 | WinCC Unified PC ✓



Define a start screen regarding a user or on a user role

Define a specific start screen to a fast access to the tasks at Runtime
- for dedicated user
- for different user roles

- Different user roles can be prioritized

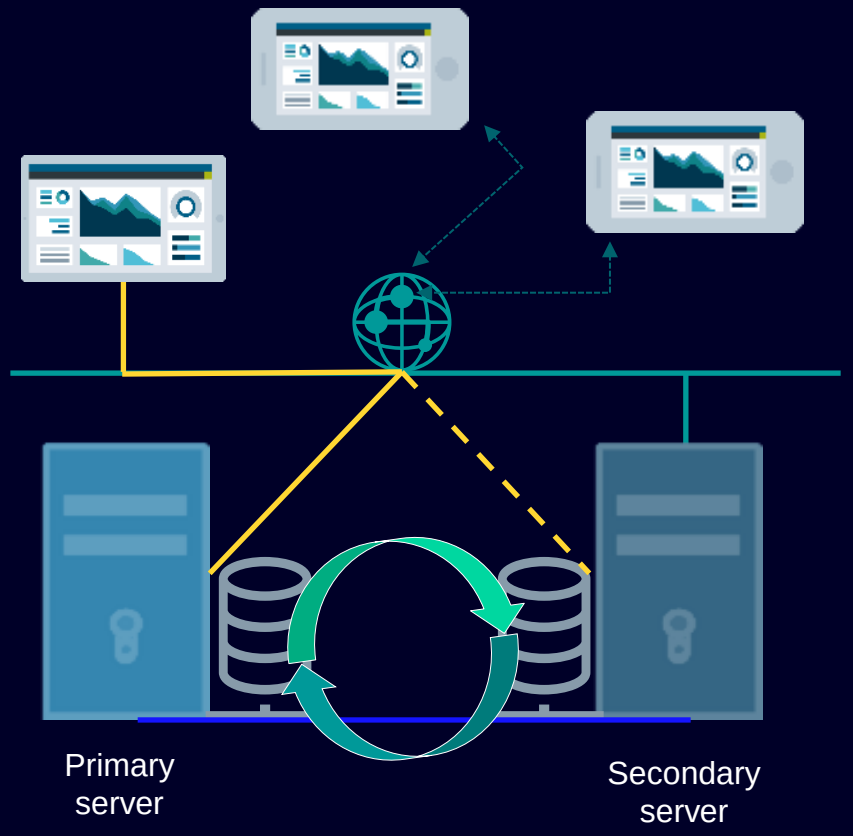
User is logged on
→ is a user specific start screen available?
→ is user assigned to a role with a specific start screen?
Use of start screen with “highest priority”

The definition of start screen is accessible via the “my WinCC Unified” web page or via the Unified Station Configurator

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WinCC Unified V20 - Redundancy

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓



Keep the operation running even on hardware failure

- Automatic switch-over to a hot stand-by server on failure to enable the continuation of production
- No loss of archived data on switch-over
  - Archived tags
  - Archived alarms
  - Audit trail
  - Paco
- Attached clients switch over to the new primary server in case on server failure

as of V19 Update 2

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WinCC Unified V20 - Redundancy
Functional scope V20

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓

Data redundancy:

- Logging of process values and alarms
- Pending alarms and current process values (external and internal tags)
- Audit trails
- Parameter Control

Communication:

- S7-1200, S7-1500, S7-300, S7-400

UI Redundancy

- Base UI Redundancy

Status and diagnosis of redundant stations

Secure communication between the redundant partners

Prerequirements

- Database Logging (MS SQL)
- Both PCs
  - need to be time synchronized
  - same hardware and operating system installation
  - configured identical
- Automated client switchover only with central user management available

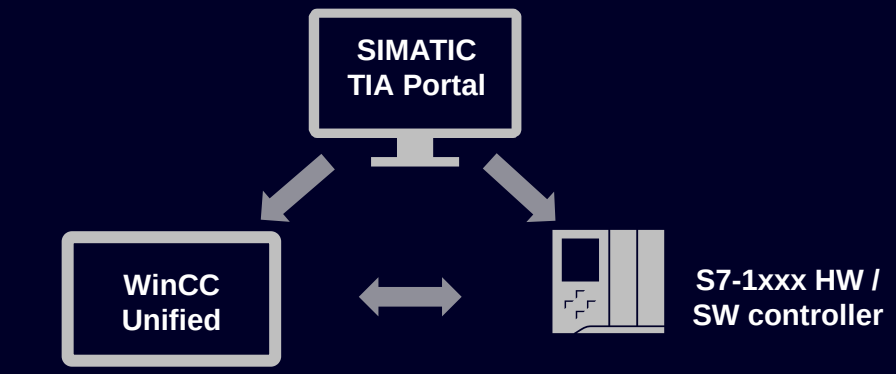
Limitations – what`s not support:

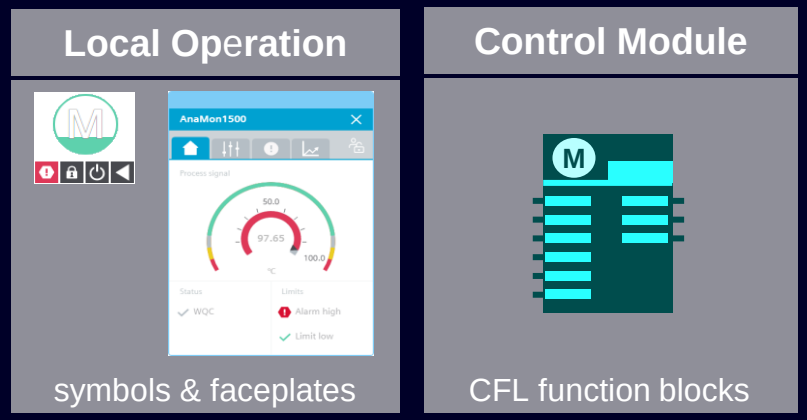
- OPC UA and 3rd party connections
- System and Process Diagnostics
- Options:
  Report Execution, Collaboration, PI Options
- Unified Data Hub must not run in parallel

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WinCC Unified V20 - Engineering Efficiency
SIMATIC Control Function Library (CFL)

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓





Standardized module engineering with a modular and memory optimized library, offering:

- TIA Portal STEP 7 (S7-1xxx HW / SW controller) and WinCC Unified Objects with optimized footprint & performance, (Industry-specific blocks like Aggr8, TimeSwitch, SetCrv, …)
- State of the art TIA Portal Engineering based on PLCOpen
- Supports virtual commissioning based on PLCSIM Advanced and SIMIT with ready to use templates tailored to CFL

Standardized Operation

- Faceplates aligned to WinCC Unified Look & Feel (HMI Design based on HMI Template Suite)
- Corporate Design via SIMATIC WinCC Unified Corporate Designer / TIA Portal

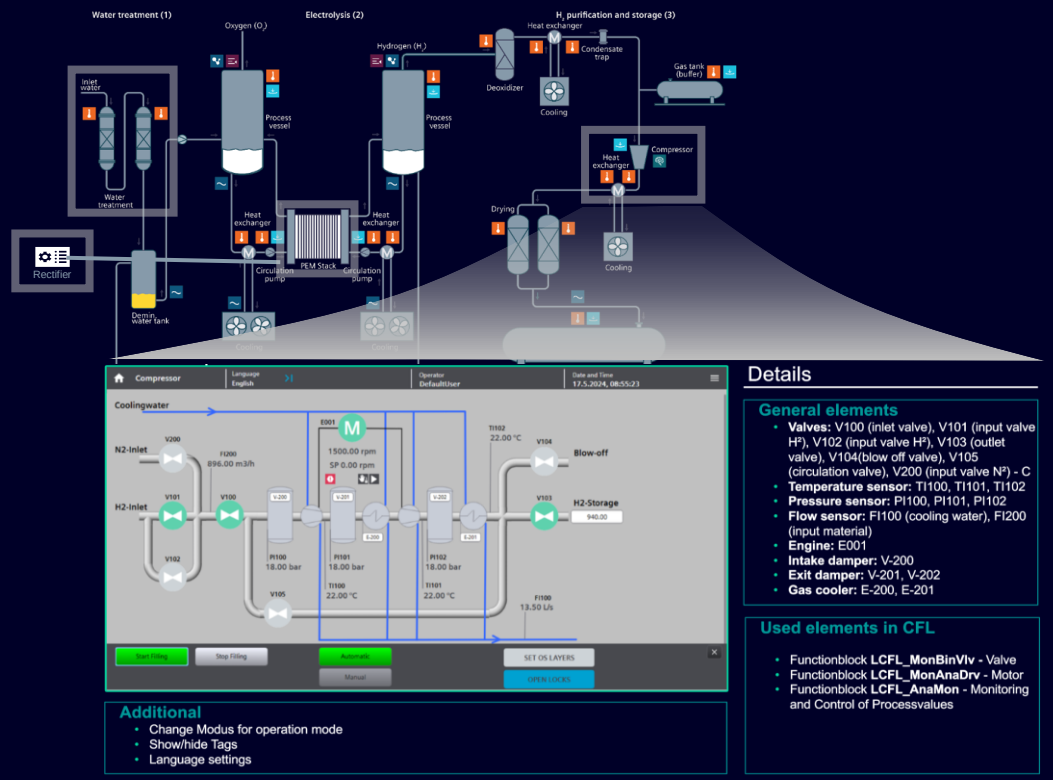
CFL can be used in MTP and Non-MTP Use Cases

Latest Version on : Simatic MTP SIOS Landing Page

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WinCC Unified V20 - Engineering Efficiency
SIMATIC Control Function Library (CFL)

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✓



Hydrogen TIA Portal Application Examples based on CFL

Latest Version on : Simatic MTP SIOS Landing Page

CFL - Industry-specific blocks

Optimized footprint & performance for S7-1xxx HW / SW controller & WinCC Unified

Drives
- MonBinDrv FP
- MonAnaDrv FP
- MonBinVlv FP
- MonAnaVlv FP

Monitor
- AnaMon FP
- BinMon FP
- DIntMon FP
- StringView FP

Operate
- AnaManInt FP
- BinManInt FP
- DIntManInt FP

Interlock
- LockView4 FP
- LockView8 FP

Common Blocks
- Maintenance FP
- DriveInterconnector

Control
- PIDCtrl FP
- Aggr8 FP
- TimeSwitch8 FP
- SetCrv FP
- Polygon FP

New

MTP Service Framework
- Service
- Procedure
- Config Parameter
- Procedure Parameter

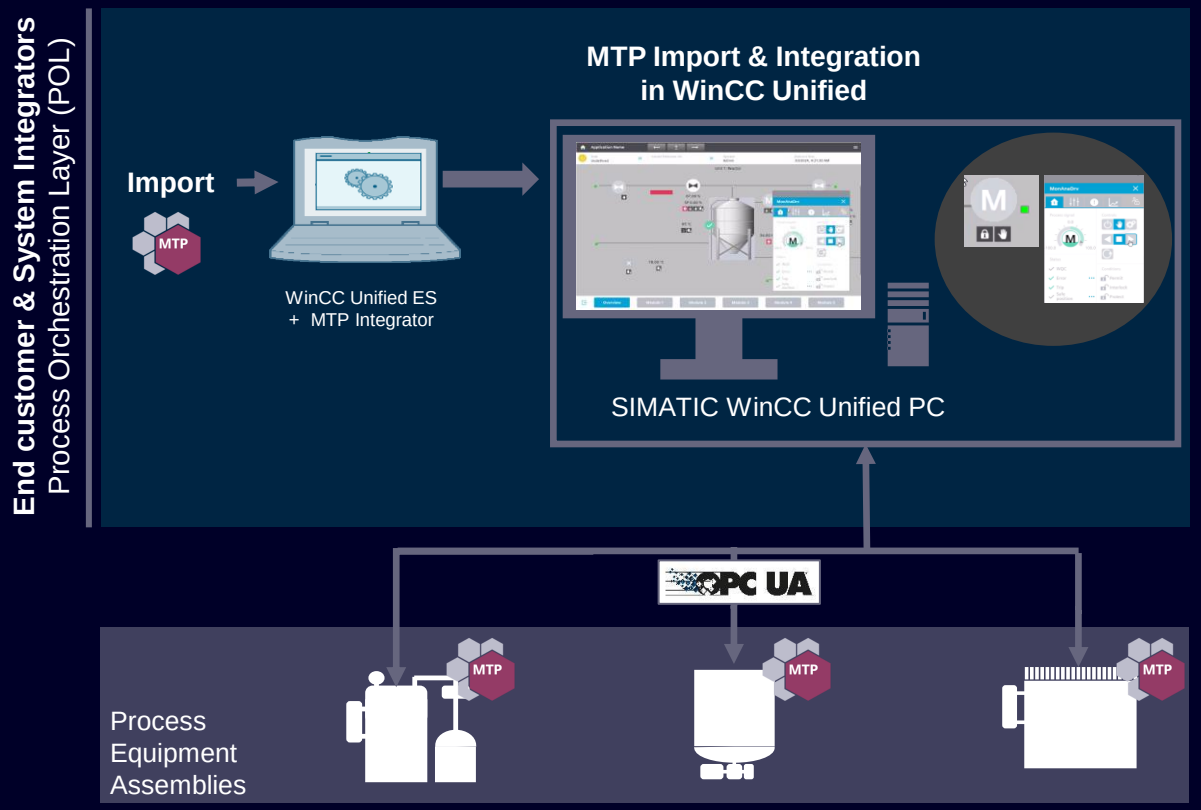
FP

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WinCC Unified V20 - Process Orchestration
Modular automation - MTP Integrator for WinCC Unified

Unified Basic Panel ✗ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Integrate standardized MTP package units / machines in WinCC Unified, including PLC and HMI components

- Standardized, line operation of package units / machines

Use MTP files (Siemens or 3rd party) to integrate (cross- vendor) machines automatically

- By instantiating the machine type within your project, the OPC UA connections, PLC tags and HMI components are created with just one click.

Controlling complete units / machines in an abstract way

- Operators can focus on the production without needing to understand details of each multi-vendor machine.
- Maximized operational efficiency, reduced training effort and consistency regarding operation, even if new modules are added modified due to changing market demands.

No. of Package Units / Machines : Unified PC RT: 10 // Unified Comfort Panel: 3

Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

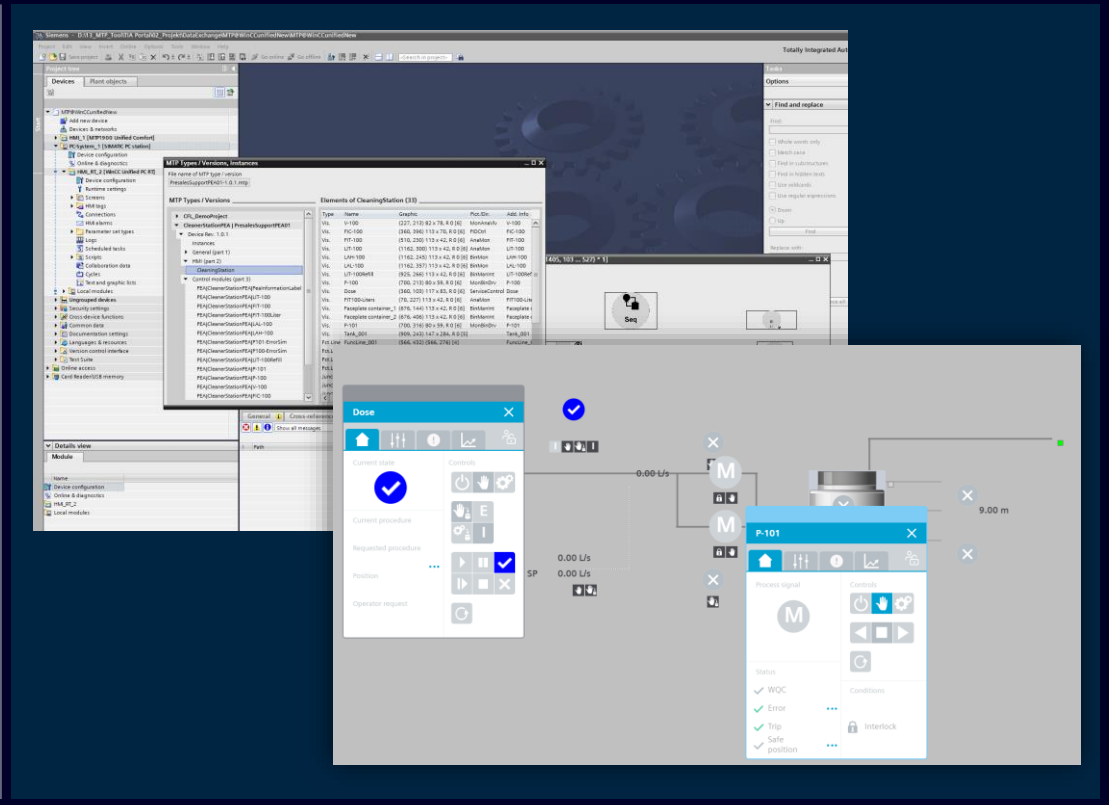
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WinCC Unified V20 - Process Orchestration

Reduce engineering effort by -70% [1] and Increase flexibility by +80% [1]

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓

End customer & System Integrators
Process Orchestration Layer (POL)



- MTP Import in WinCC Unified Engineering[2]
- Type management incl. full versioning for your MTP files
- PEA instance management
- Static and dynamic HMI Integration (MTP Part 2 + 3)
- Monitoring and control via Faceplate (blockicons and detailed views) Orchestration of plantwide HMI (part 3)
- Manual operation of MTP Services via HMI (part 4) — New
- MTP Multilanguage Support — New
- Native OPC UA communication with configurable levels of security mechanisms (draft part 5/5.1) [3]
- POL-based alarms (draft part 6/7) [3]

[1] Source: ZVEI, 2022
[2] Implementation compliant to the noted parts of the MTP Specification (VDI/VDE/NAMUR 2658)
[3] Concepts for runtime interoperability (part 5/5.1) and alarming (part 6/7) are not fully specified, yet

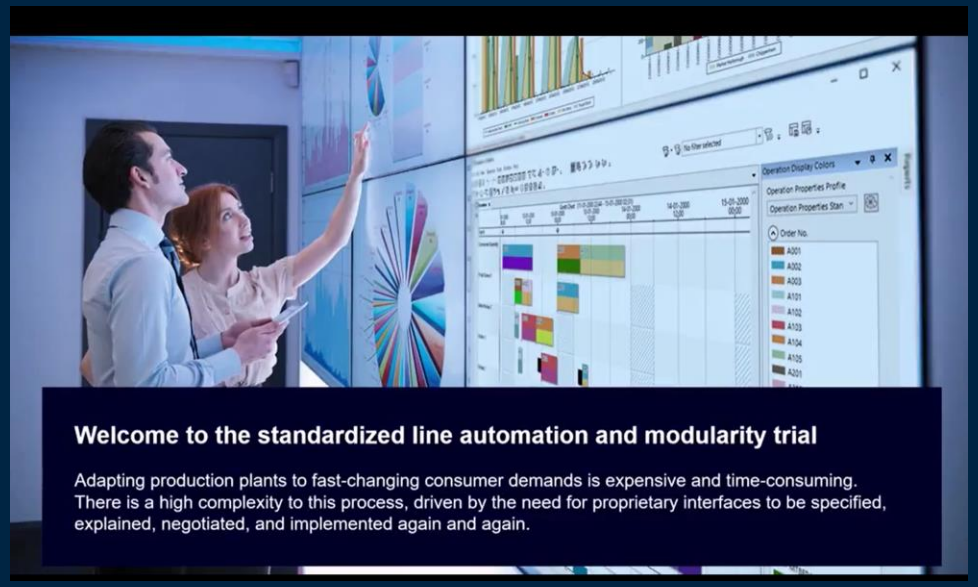
Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

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WinCC Unified V20 - Process Orchestration
SIMATIC MTP Integrator for WinCC Unified Trial – Simply try it out

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✓

End customer & System Integrators
Process Orchestration Layer (POL)



MTP trial – Simply try it out

Try our 30-day rapid line automation engineering with MTP trial.
No installation is required. Start exploring in minutes.
(Chrome/Firefox/Edge/Safari recommended)

Easily adapt production lines to fast-changing consumer demands with a module based standardized approach

- Adding new equipment or modifying an existing and running production line is typically complex, time consuming and risky
- Cell or line visualization required for better overview and central operation needs, if manually engineered, consumes substantial time and effort and is error prone
- With the standardized Module Type Package (MTP) approach, you can reduce risk, engineering effort and downtime, as well as shorten the time to easily integrate new equipment into an existing production line
- MTP is a widely standardized and market-proven technology that can be purchased off-the-shelf

Module Type Package (MTP)

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TIA Portal V20
SIMATIC WinCC

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V new
- Limited Sales release in USA

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

TIA Portal Options

- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
- **SIMATIC Robot Library**
- **OPC UA**
- **SIMATIC S7-PLCSIM / S7-PLCSIM Advanced**
- **SIMATIC Target for Simulink**
- **TIA Portal Test Suite**
- **SIMATIC Visualization Architect (SiVArc)**
- **SIMATIC Modular Automation (MTP)** new
- **Central User Management (UMC)**
- **Modular Application Creator**
- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

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WinCC Innovations V20
Highlights WinCC RT Advanced

WinCC ES

- WinCC RT Advanced can be engineered with TIA V20
- Library enhancement filter library types for RT Advanced

No new RT Advanced version

Ensured Compatibility of WinCC Advanced

- Newest update of stable V17 version of RT Advanced available
- No new licenses necessary for WinCC RT Advanced V17 necessary

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WinCC Innovations V20
Highlights WinCC RT Professional

Maintainabilty
Support of MS SQL 2022

Communication
UDT support - Max char 127 (depth 26)
Up to 10 S7 connections are included in the WinCC RT prof basic license

WebUX – Deep link
Direct access to specific screens or functions within the application

WebUX – Recipe
Support of recipe control

TIA Library
Enhancement filter library types for RT Professional

SVGHMI Library
Embedding SVGHMI Graphics in WinCC RT Professional Screens
Same Library as WinCC V8 or WinCC Unified

WebUX – AR APP
Support for SIMATIC Unified AR App for iOS

WebUX – License
New licenses for WebUX max clients

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TIA Portal V20
SIMATIC STEP 7

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- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

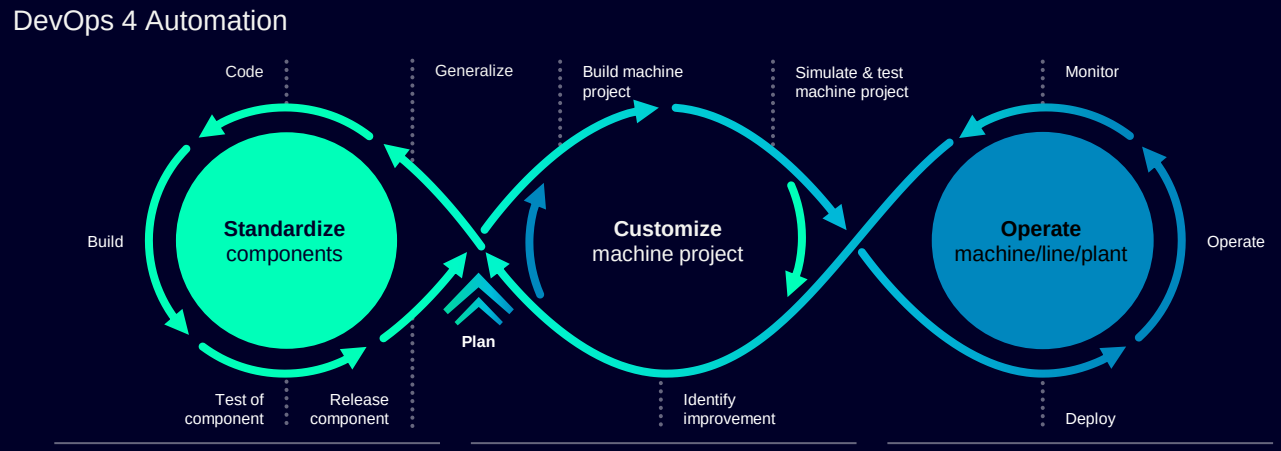
- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

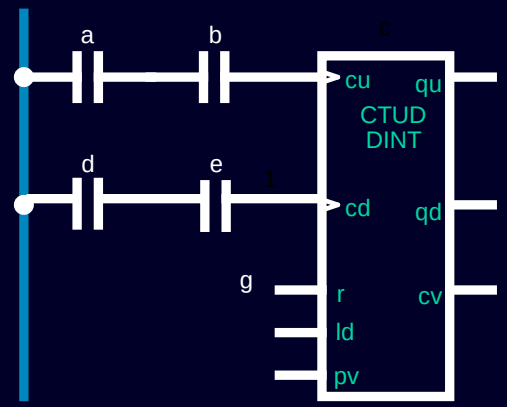
TIA Portal Options

- **SIMATIC STEP 7 Safety**
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STEP 7 – Innovations
SIMATIC Source Documents: New export format for LAD blocks, DBs & UDTs






```
RUNG wire#powerrail
    Contact( a )
    Contact( b )
    c.Ctud( dint )( cd := wire#w1
        , r := g
        , ld :=
        , pv :=
        , qd :=
        , cv := )
END_RUNG
RUNG wire#powerrail
    Contact( d )
    contact( e )
END_RUNG wire#w1
```

Features

- **Human readable** representation of graphical code
- Source code only - no internal meta information
- Version independent syntax
- Including multilingual comments
- Works for LAD and F-LAD & DBs & UDTs
- Accessible via Openness and VCI*

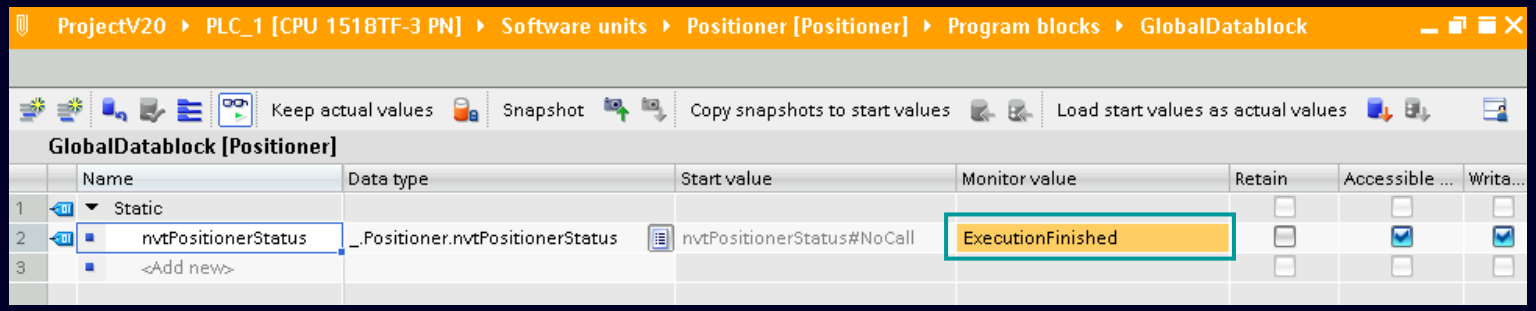
Benefits

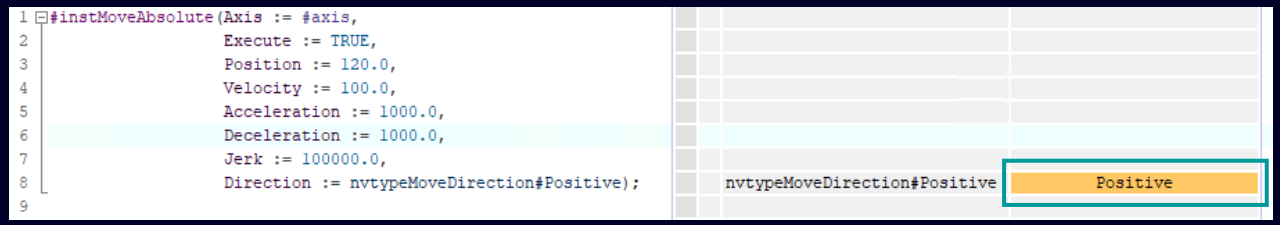
- Human-readable representation ensures **easy use with external tools** (e.g. GIT, Beyond Compare, …) and code generators
- Version-independent syntax **simplifies** compatibility when **sharing source code across various TIA Portal versions**
- Easy **tracking of safety block changes** in external code repositories

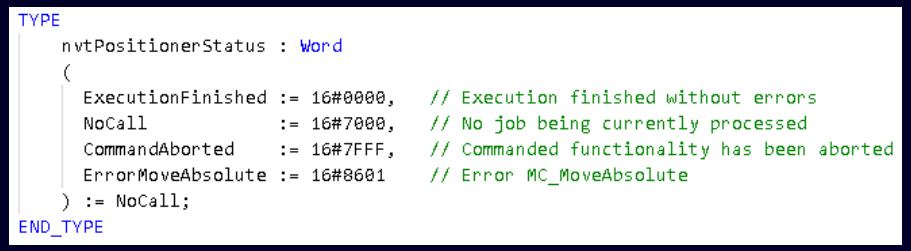
*With a V20 Update

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STEP 7 – Innovations
Named value data types within Software Units – Online improvements







Speaking names for named values

Since V19 user can create within Software Units data types with named values (NVTs). Now during online actions like monitoring and trace, we display the values such as the defined and meaningful names.

New Features

- **Online displaying speaking names** for NVTs at
  - Code block editor (SCL, LAD/FBD, Graph)
  - DB interface editor
  - Watch- and force table editor
  - Trace
- **Applying Namespace** of Software Unit to underlying NVTs
- **Openness Import/Export** of NVTs

Improved commissioning and maintenance efficiency

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STEP 7 – Innovations
Named value data types – Textual Interface & Library improvements

```
1  FUNCTION_BLOCK "SCLBlock"
2
3  VAR_INPUT
4    NVTDecl : Simatic.Colors := Simatic.Colors#RED;  //NV Constant as datatype
5
6    ArrayNVT: Array[_.Boundary#MIN .._.Boundary#MAX] OF Int;  //NV Constants as array boundary
7
8    stringVar : String[_.Length#MAX]; //NV Constants as string length
9
10 END_VAR
11
```

The block is read-only because it is know-how protected.

2/2

Block_1

	Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...
1	Input				☐	☐	☐
2	Input_1	Simatic.Colors	Simatic.Colors#RED	Non-retain	☑	☑	☑
3	Input_2	DInt	Simatic.Colors#GREEN	Non-retain	☑	☑	☑
4	Output				☐	☐	☐
5	Output_1	Array[0..1] of Bool		Non-retain	☑	☑	☑
6	InOut				☐	☐	☐
7	Static				☐	☐	☐

Colors.nvt		V 0.0.5
V 0.0.5 [default]		V 0.0.5
V 0.0.4		V 0.0.4
V 0.0.3		V 0.0.3
V 0.0.2		V 0.0.2
NVT_Library.nvt		V 0.0.1
V 0.0.1 [default]		V 0.0.1

New Features

- **Textual interfaces** are supporting NVTs
- NVTs as **library types**
- Safety blocks in type library can utilize NVTs
- NVTs can be part of typed knowhow protected blocks

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STEP 7 – Innovations
Named value data types – tracing with PLC Trace



Tracing Named Value Tags

The trace recognizes NVTs directly in trace definition. Recorded values in the diagram are automatically resolved to NVT definition and displayed accordingly.

Benefits

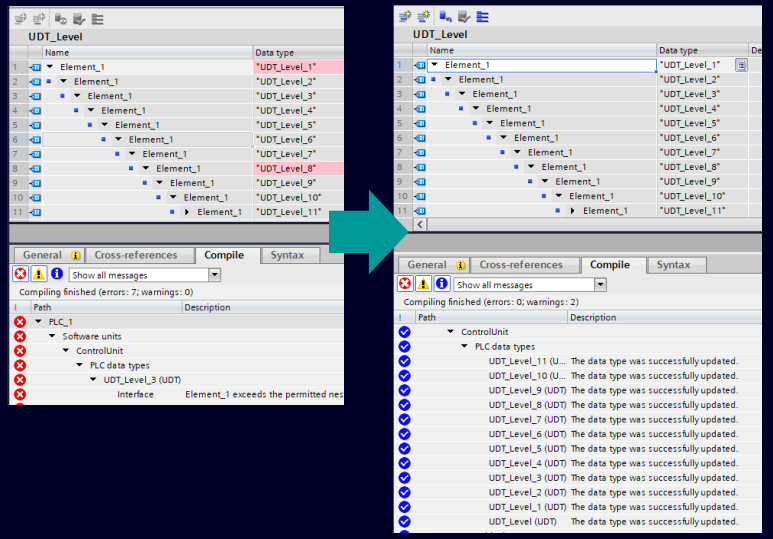
- **Automatic representation of tag names**, instead of numerical representation
- **Tags can be used as trigger**
- Undefined states are also visible in diagram
- NVTs are supported in all traces ((long-term) trace, (long-term) project trace)

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STEP 7 – Innovations
General Improvements

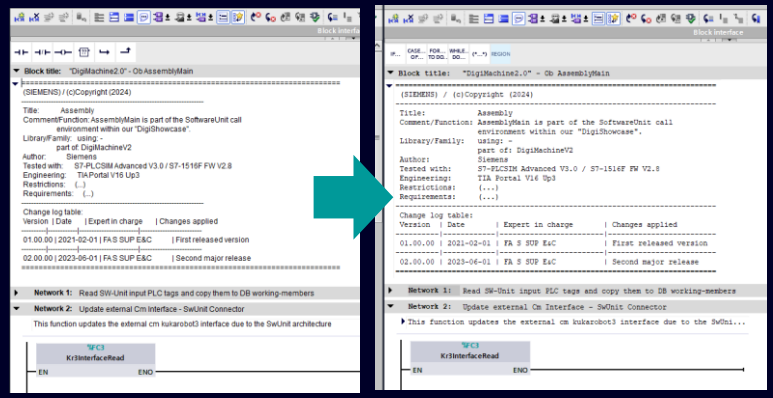
Increased nesting depth for structures

- For S7-1500 >= 4.0 the nesting depth for PLC data types, STRUCT tags, and ARRAY of STRUCT/UDT tags has been increased from 8 to max. 26 elements
- Using an ARRAY of STRUCT/UDT, which requires 3 hierarchical levels each, reduces the maximum nesting depth accordingly



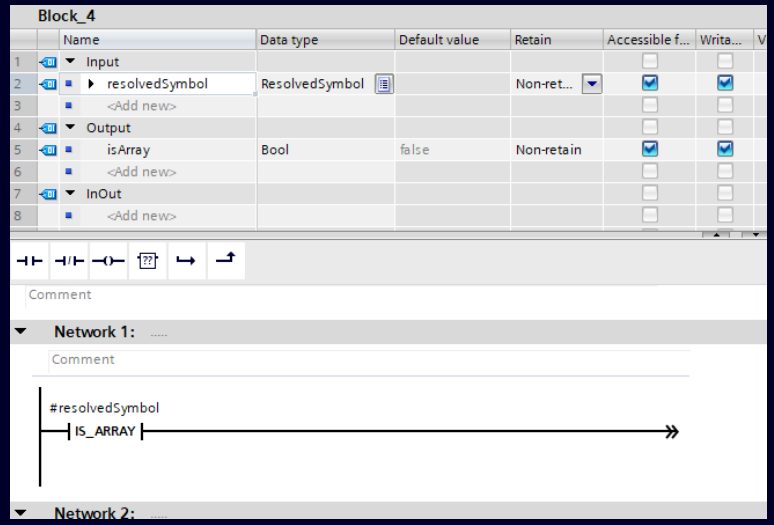
Font adoption for title & comments

- Font type can be changed for block and network title and comments via Global setting
- Using monospace fonts comments can be easier structured
- Network titles & comments can be zoomed in / out



Is_Array / Count- & TypeOfElements for ResolvedSymbol

- These functions can now also be used for resolved symbols:
  - Is_Array
  - CountOfElements
  - TypeOfElements
- Allows appropriately handling of arrays from a resolved symbol

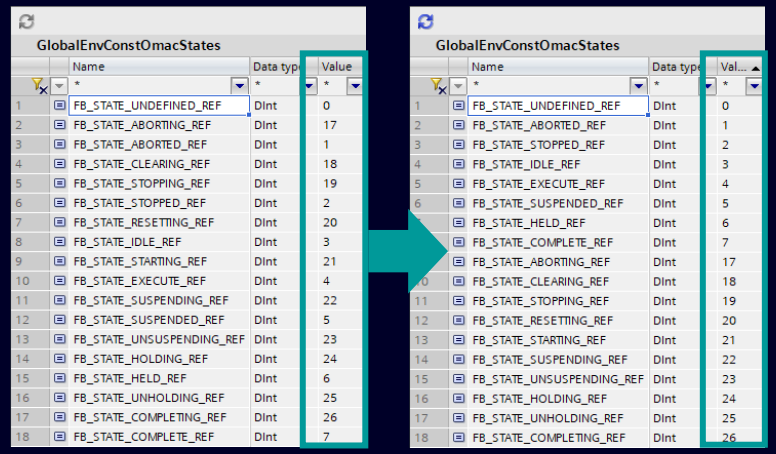


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STEP 7 – Innovations
General Improvements

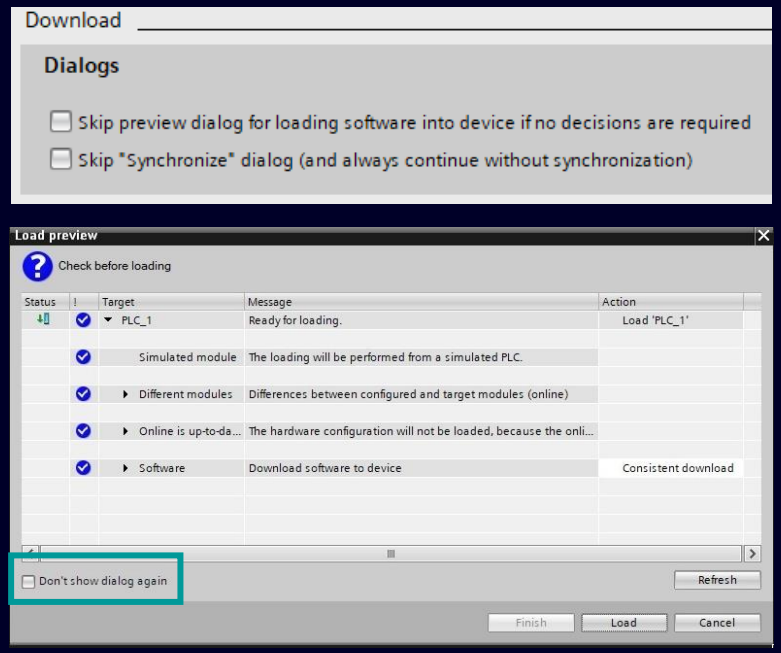
Tagtable: Sort by value

- Natural sorting of user and system constants in the filter view of the tag table editor



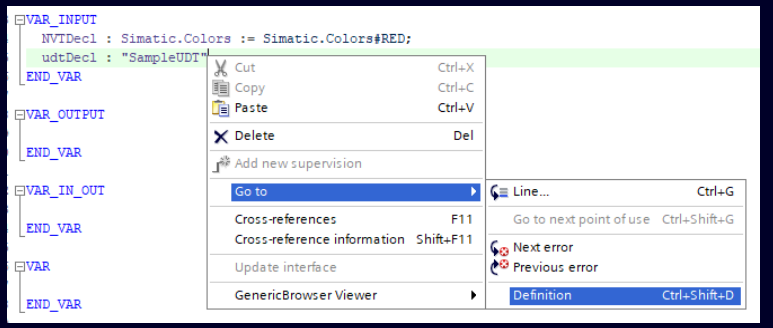
Hide Download Preview & Sync Dialog

- Hide Download Preview / Finished & Synchronize before loading dialogs
- Only shown, when user interaction necessary



Go To Definition – Improved behavior in Textual Interface Editor

- Enhanced the Textual Interface Editor (SCL only) for improved navigation to complex declarations of UDTs, Blocks, and NVTs.

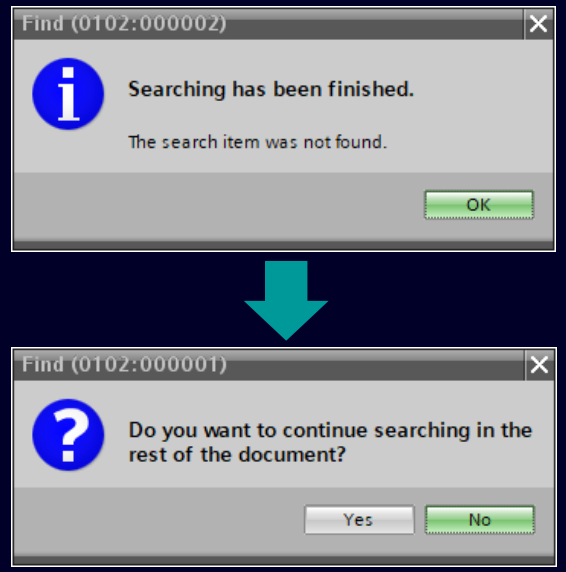


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STEP 7 – Innovations
General Improvements

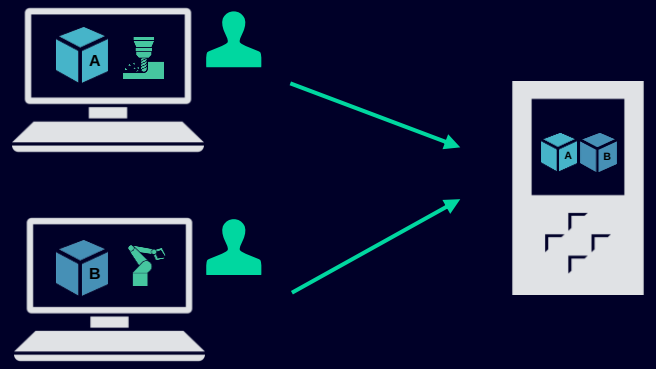
Search Replace improvements

- In the Project Navigator Overview now search & replace in the details view is possible
- Local search can now be directly continued for the rest of the block.



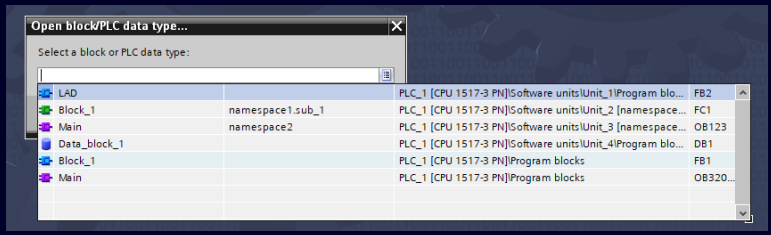
Improved Software Unit download behavior

- Before download, the relations between the Software Units are checked more thoroughly.
- Loading dependent Software Units is only necessary if components of the other Software Unit are actually used



F7 block open improvements

- Search scope of dialog is now always the complete PLC (context independent)
- Increased size of drop-down box for better readability
- Adjusted size of drop-down box is stored



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TIA Portal V20
SIMATIC Motion Control

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V
- Limited Sales release in USA

new

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

TIA Portal Options

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- **SIMATIC Safe Kinematics**
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- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

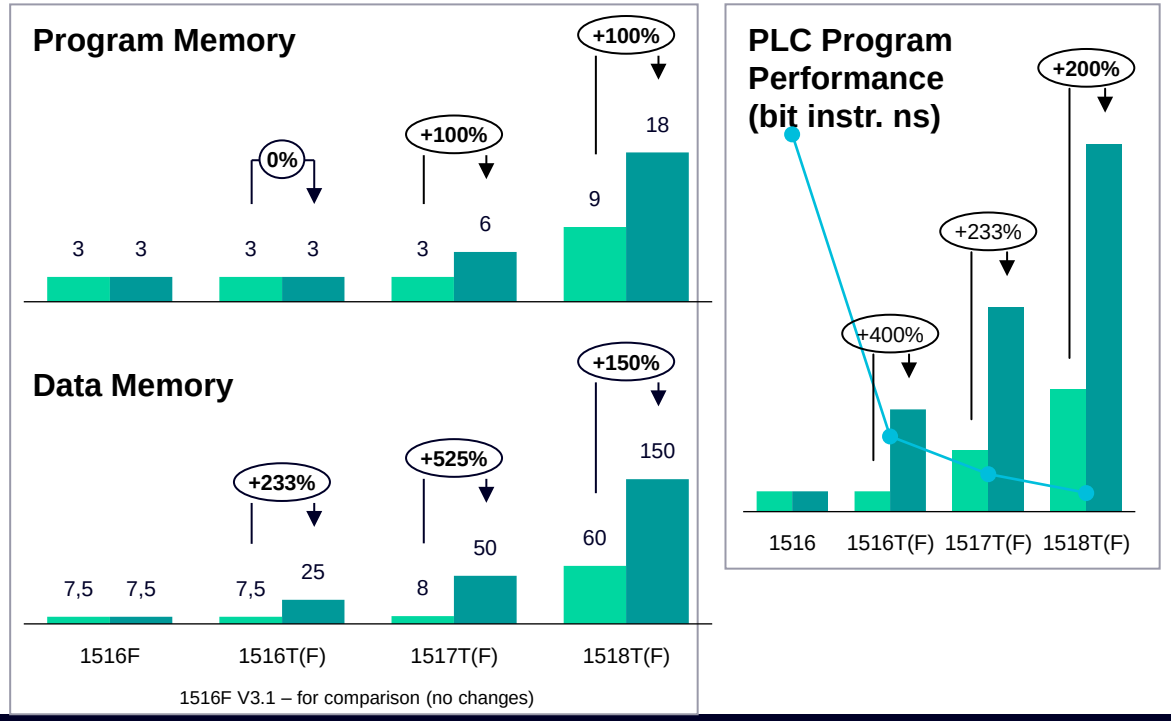
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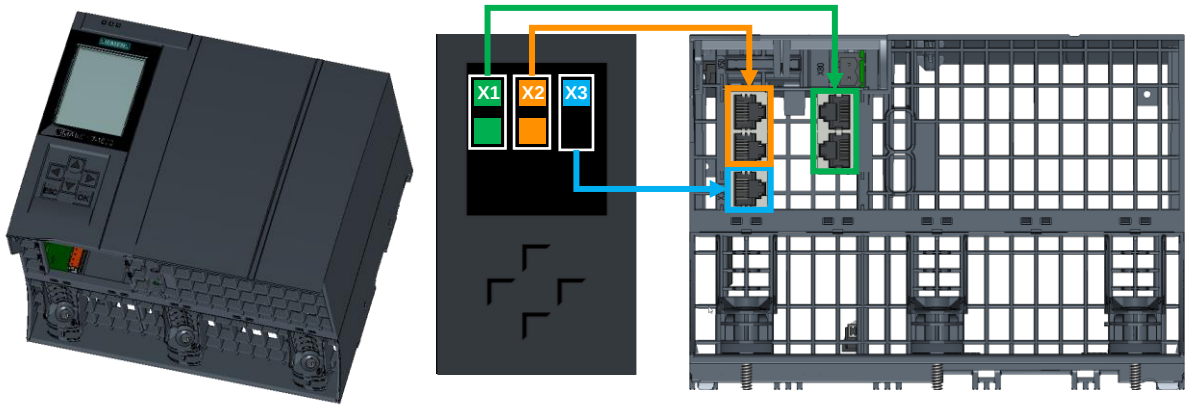
New Hardware S7-1500 T/TF with FW V4.0

- CPU S7-1516T-3 PN
- CPU S7-1516TF-3 PN
- CPU S7-1517T-3 PN
- CPU S7-1517TF-3 PN
- CPU S7-1518T-3 PN
- CPU S7-1518TF-3 PN

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New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs





- **New hardware for S7-1500 1516T(F) / 1517T(F) / 1518T(F) CPUs**: More memory, More Performance, Higher communication performance, second IRT Interface, 64 IO-Devices per IRT Interface or 256 IO-Devices per IRT Interface with DFP, G-Bit Interface, secure boot, functional compatible to previous CPU generation

- **Support for standardization** that requires more memory for more code and the reliability on performance to new amount of code
- **Higher communication performance** to address the IT/OT communication use case
- **More Motion Control Performance** to meet high end applications

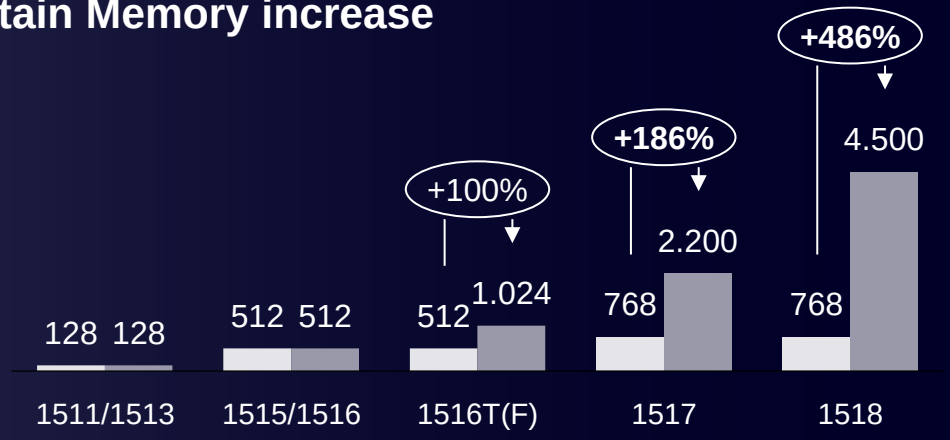
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New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs

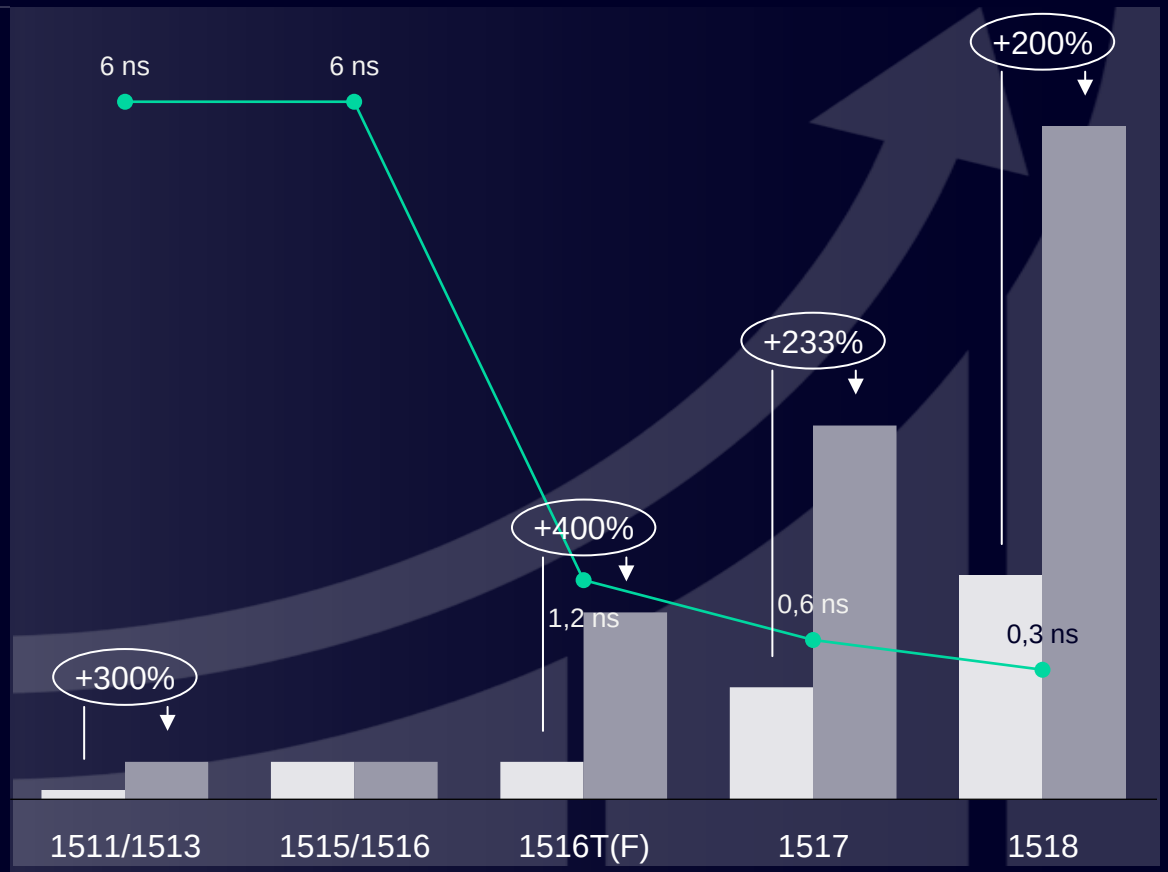
- **Significant PLC program performance increase**

➢ **Easier controller selection**
➢ **More customer use cases can be realized**

- **Retain Memory increase**



Retain memory in kByte



PLC Program performance

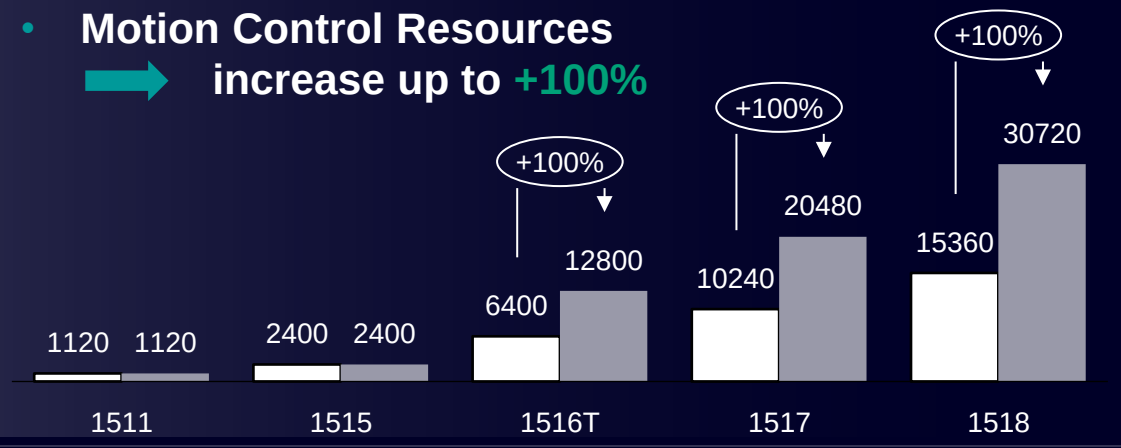
■ FW V3.1 (current article no.) ■ FW V4.0 (current + new article no.) —● Bit performance

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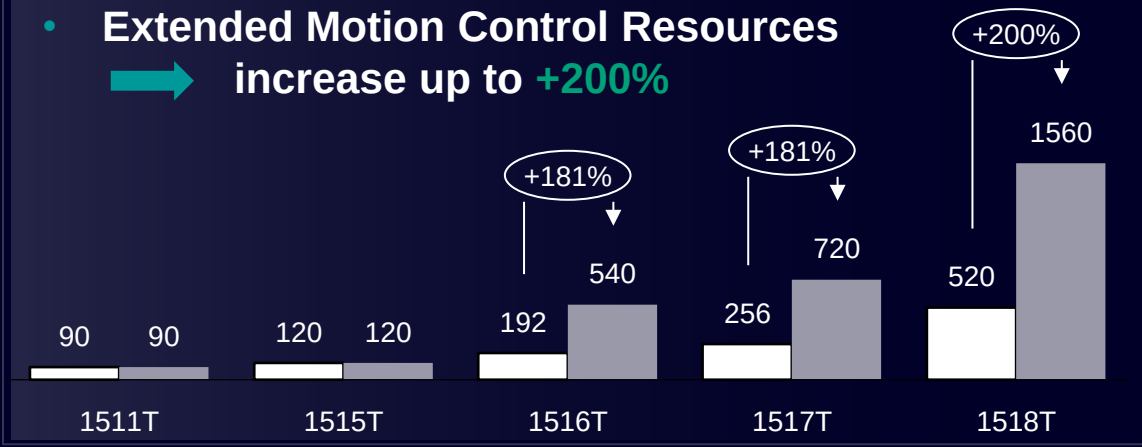
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New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs

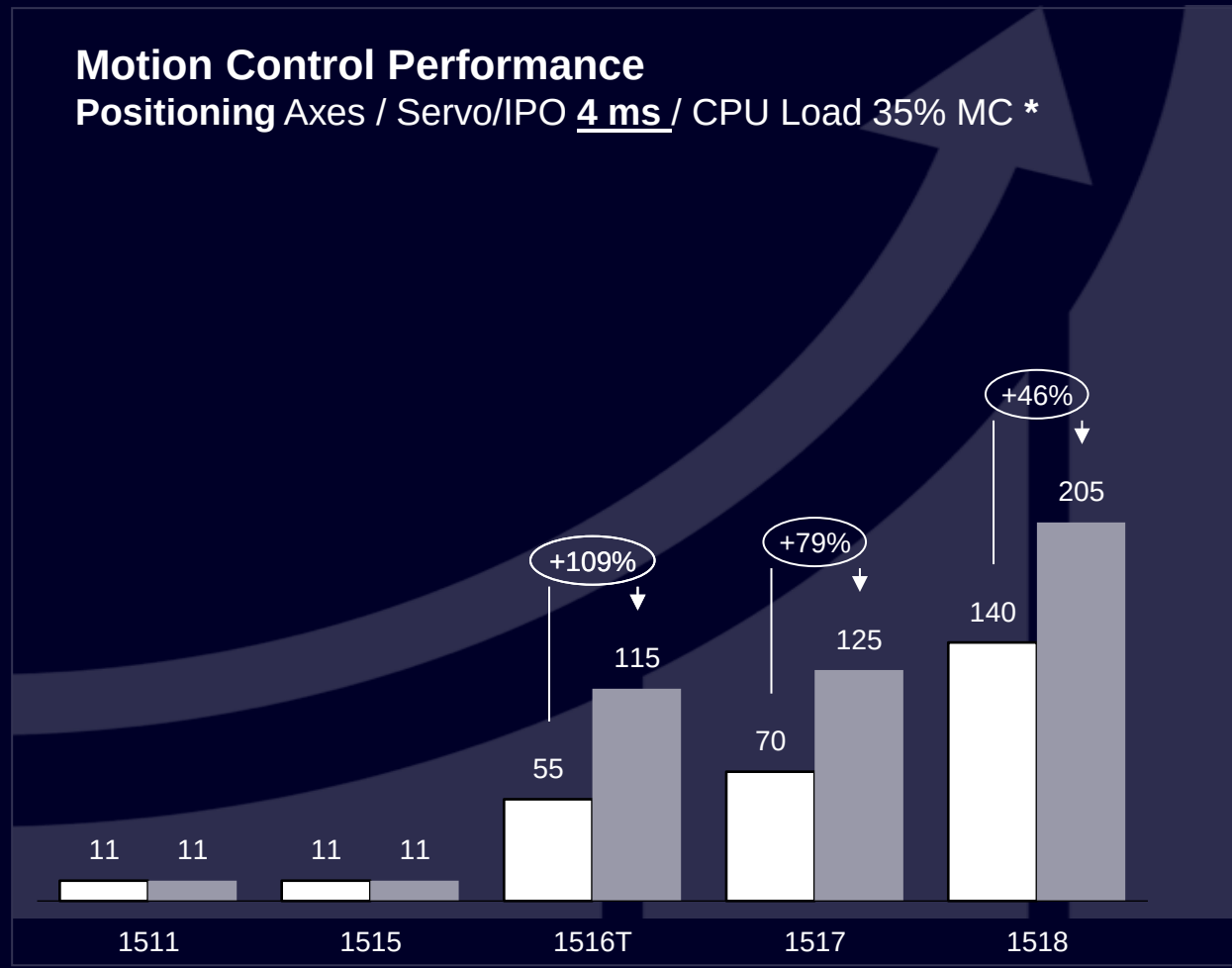
- **Motion Control Resources**
  increase up to +100%



- **Extended Motion Control Resources**
  increase up to +200%



Motion Control Performance
Positioning Axes / Servo/IPO **4 ms** / CPU Load 35% MC *



■ FW V3.1 (current article no.) ■ FW V4.0 (new article no.)

1511T / 1515T V3.1 – for comparison (no changes with FW V4.0)
* Depending on the application

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New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs

New mechanical design

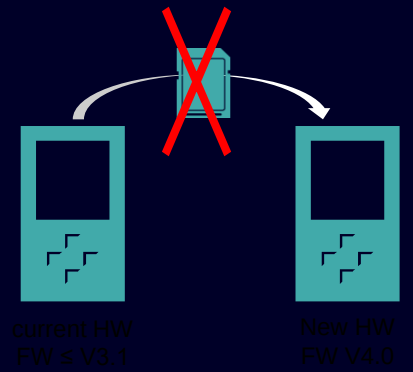
- The display is now integrated into the CPU like in the new 1515/1516 CPUs
- Installation dimensions remain identical
- RUN/STOP switch is replaced with RUN/STOP buttons
  - No more "cancelling" of the RUN/STOP switch
  - "STOP ACTIVE" indicates that the CPU was switched to STOP via the STOP button
  - Memory reset/Reset operation: Identical as before
- Display can now be read – even when the cover is open
- Mechanical manipulation protection is retained
- New Display implementation
    - No separate Display FW needed



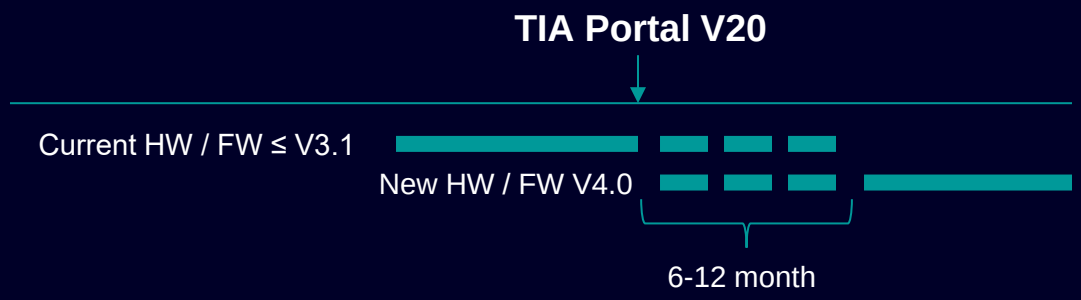
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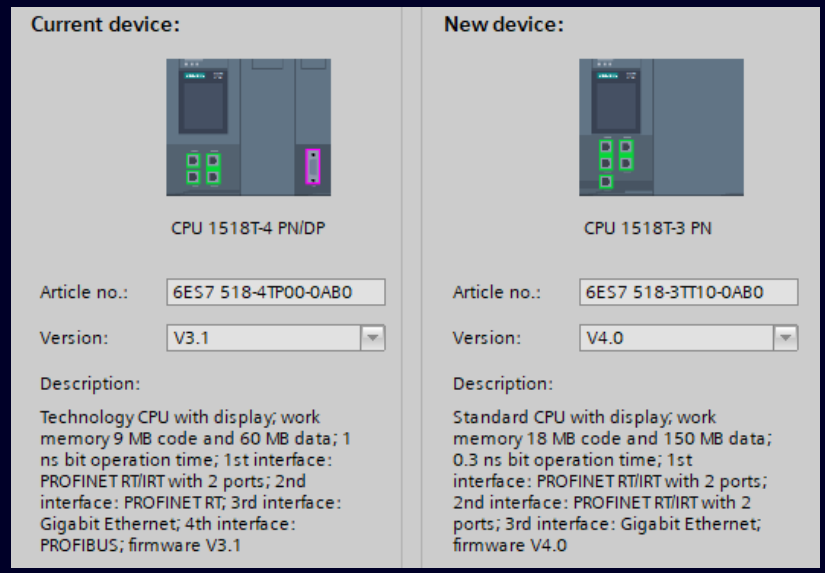
New Hardware S7-1500 T/TF
Compatibility of CPU 1516T / 1517 / 1518 with new HW

- FW V4.0 only for new article numbers
- No PROFIBUS Interface on board → No spare part compatibility
- Fully functional compatible (except PROFIBUS DP). STEP 7 project can be used in the new CPU after “change device” in HW config.



- Parallel delivery of the old and new HW for 6-12 month:





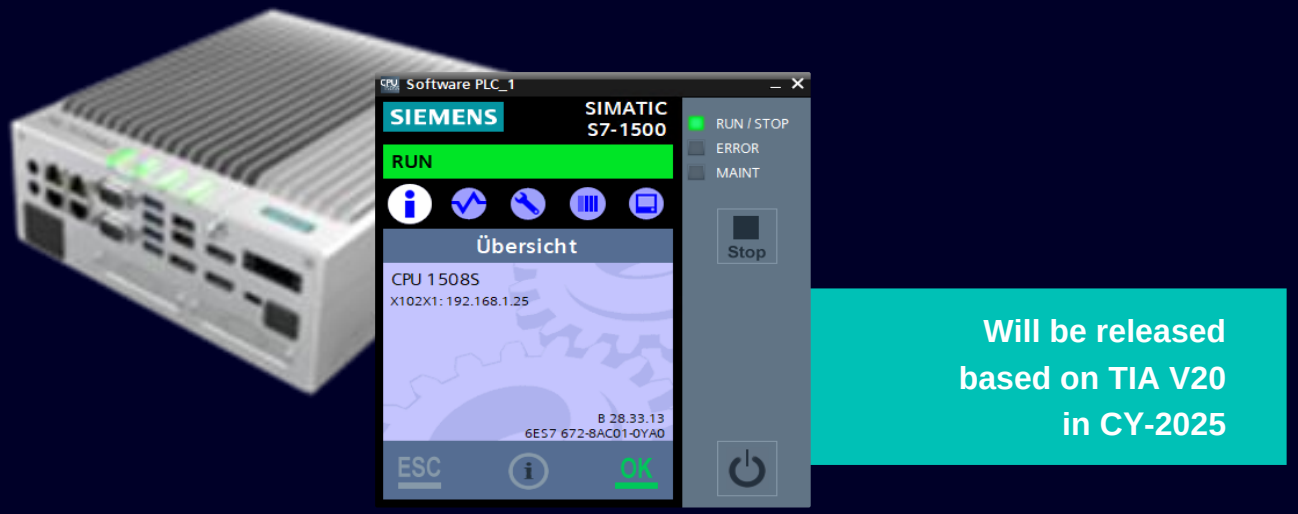
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New SIMATIC Software Controller T(F) with FW V40.0

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New SIMATIC Software Controller 1508S T(F)
Software Controller evolution with new hardware

SIMATIC Software Controller T(F)
for high-end Motion Control



Will be released based on TIA V20 in CY-2025

SIMATIC BX-59A with Intel core i7 13th generation

SIMATIC CP1625-2 (PCIe card for PROFINET IO IRT)

Software Controller CPU 1508S T/TF (V40.0)

- **IPC BX-59A (i7)**
  - High performance IPC with Intel Raptor Lake CPU
  - Platform designed for high modularity and flexibility
- **CP 1625-2 (PCIe)**
  - PCIe card for PROFINET IO IRT
  - 2 IRT interfaces (4 ports)
  - Increased quantity structure
- **Software Controller V40.0:**
  - Latest S7-1500 firmware (e.g. 64 Bit)
  - Increased number of (Extended) Motion Control Resources

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Motion Control Innovations

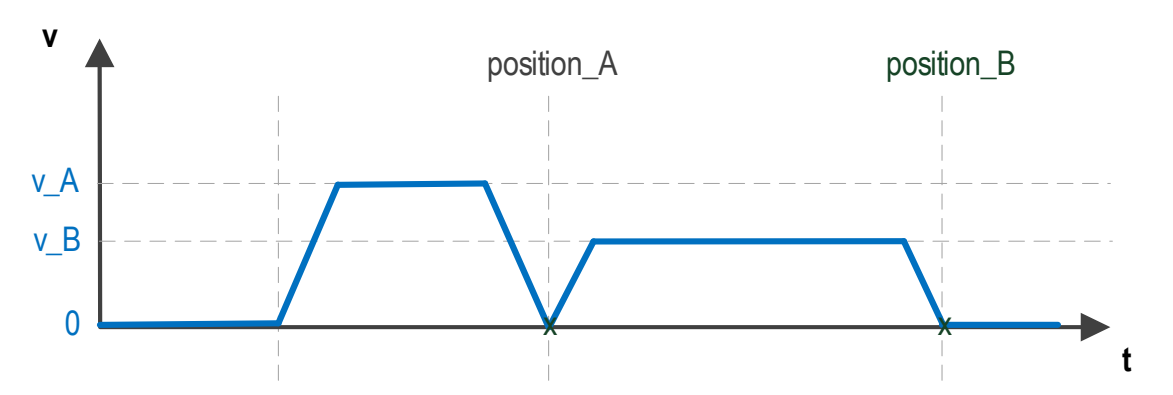
FW V4.0 (TIA Portal V20)

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Motion Control – Innovations
New Single Axis Operations

Axis

- Improved FB MC_Halt: New mode to halt only the basic movement.
  The superimposed movement is continued.
- Change effectiveness of TO-DB tag “<TO>.Actor.RemoveEnableReaction”
- Improved FBs MC_MoveAbsolute / MC_MoveRelative: Append movement without blending (step 1)



Execution system / Acyclic tasks

- Improvement of reaction time for acyclic tasks (e.g. MC_InterpolateCam)

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Motion Control – Innovations
New Synchronous Operations

Cams
- New TO types TO Cam_6kSeg / TO Cam_600Seg with 6000 / 600 polynomial segments and 50 points
- New TO-DB tags at TOs Cam_* for the following values at start and end of a cam
- Improvement of FBs MC_GetCamFollowingValue(Cyclic): Select mode and read third derivative from a cam

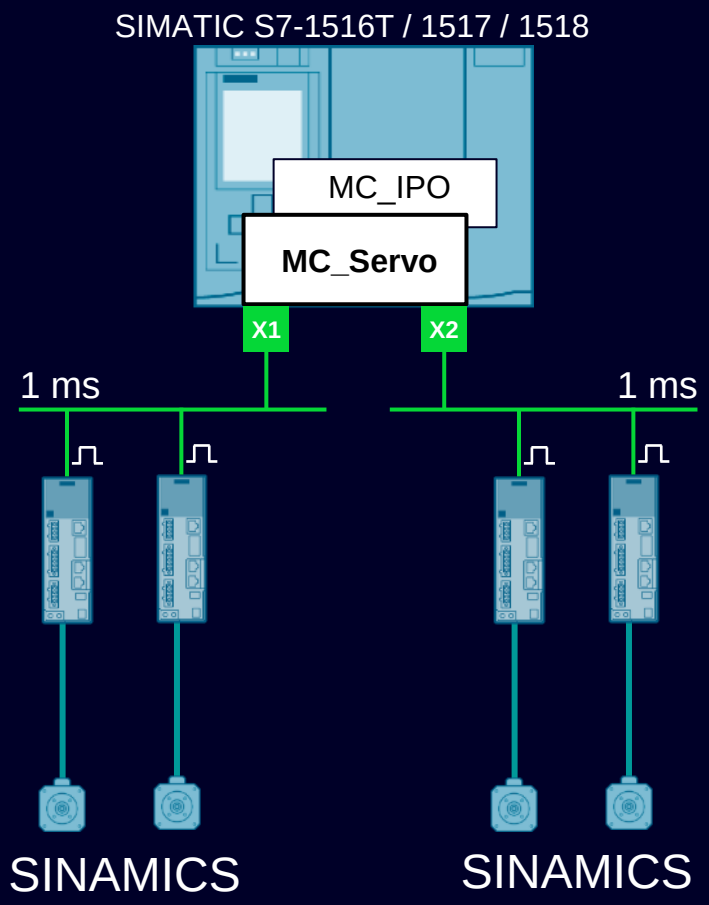
Synchronizing
- Improvement of FB MC_CamIn: Direct synchronous setting at specified leading value position
- Improvement of FB MC_GearInPos: Subsequent synchronization with specified MasterSyncDistance
- New TO-DB tags at TO SynchronousAxis for the actual gear ratio numerator and denominator
- Toleration of a leading value reversal during synchronization and desynchronization

Cross-Project synchronous operation
- Distributed synchronous operation between several CPUs programmed in different projects using new PN/PN-Coupler that synchronize two IRT domains and support isochronous data transfer between domains.

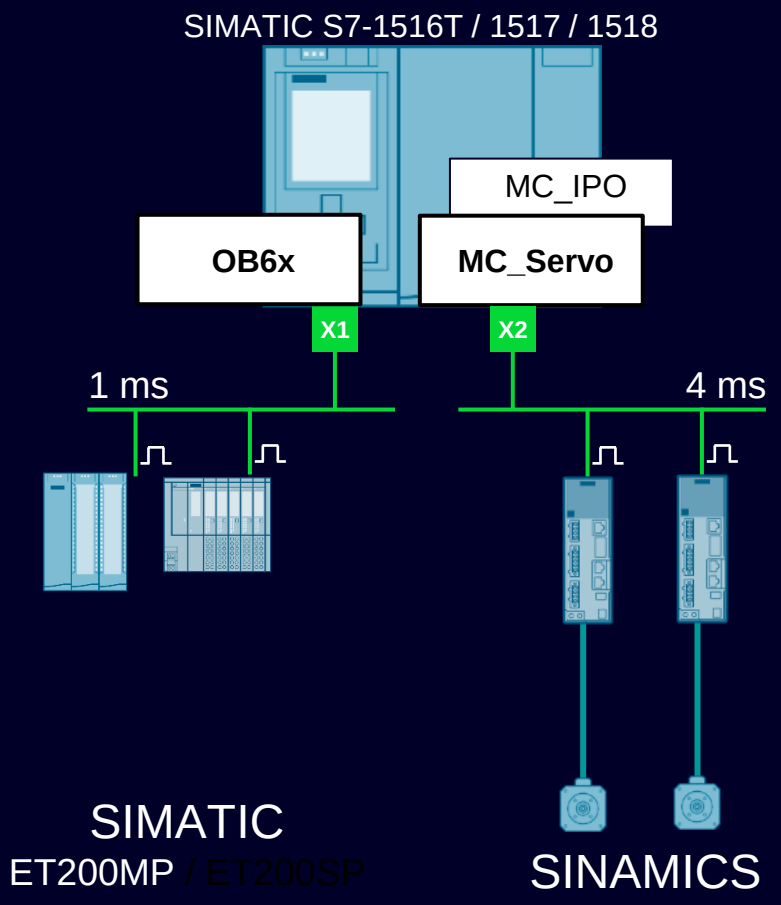
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Motion Control – Innovations
Support of second PROFINET IRT Interface

Interfaces in “Coupled” mode



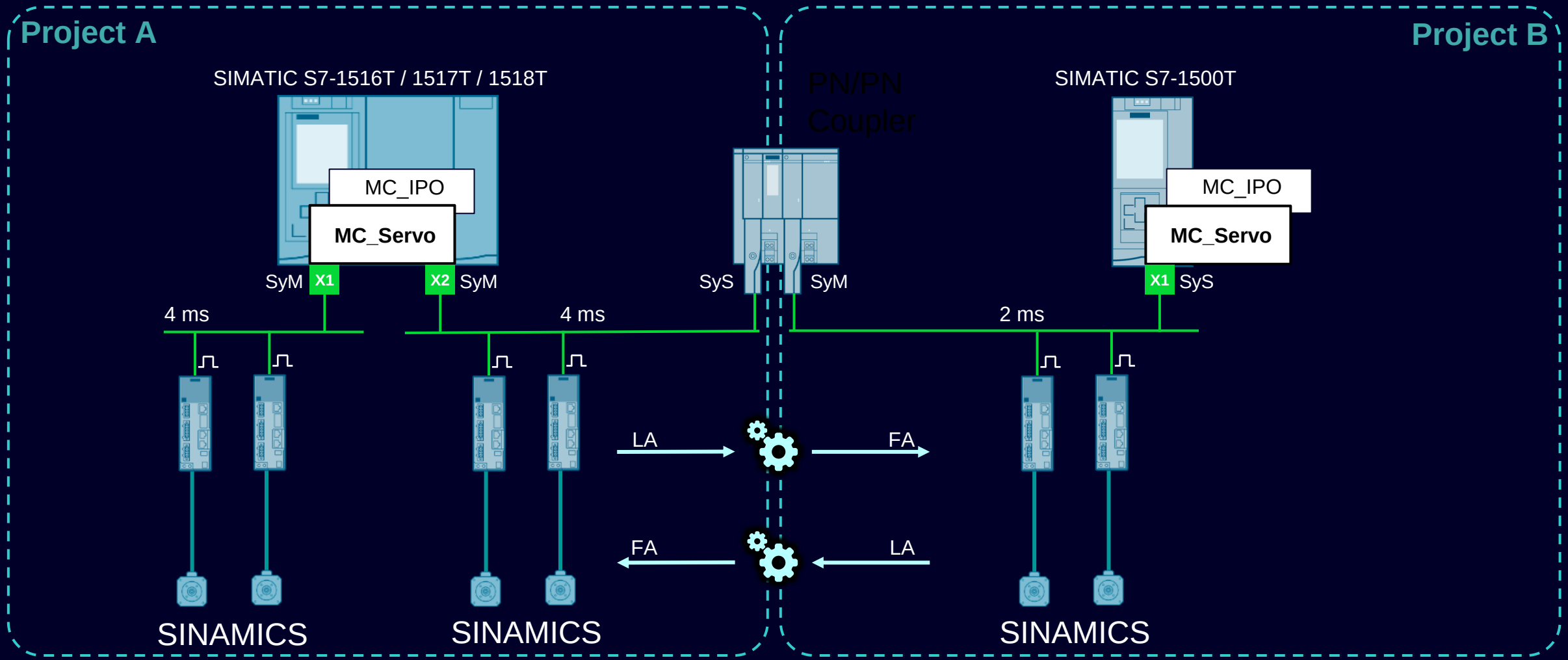
Interfaces in “Synchronized” mode



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Motion Control – Innovations

Cross-PLC synchronous operation using PN/PN Coupler



SyM = Sync master
SyS = Sync slave

LA = Leading axis
FA = Following axis

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Motion Control – Innovations
Kinematics

Kinematics
- Conveyor Tracking: Individual dynamic reserve per OCS for dynamic adaption
- New TO-DB tag StatusPath.DynamicLimit for motion commands
- Accept negative length D1 at all Deltapicker 3D

Interpreter
- MCL Language Extensions
  - waitEvent() instruction supports expressions
  - New constant “NULL_POS” for circAbs() and circRel() instructions
- Debugging of MCL programs
  - Breakpoint in Interpreter program editor
  - Toolbar extensions for debugging
  - Debug extensions in the basic online view

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Motion Control – Innovations
Named value data types – tracing with PLC Trace



Tracing Named Value Tags

The trace recognizes NVTs directly in trace definition. Recorded values in the diagram are automatically resolved to NVT definition and displayed accordingly.

Benefits

- **Automatic representation of tag names**, instead of numerical representation
- **Tags can be used as trigger**
- Undefined states are also visible in diagram
- NVTs are supported in all traces ((long-term) trace, (long-term) project trace)

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TIA Portal V20
SINAMICS Startdrive & DCC

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- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
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new

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- Process Orchestration (MTP)

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Portal Options

- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
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- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

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- Kinematics

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SINAMICS Startdrive & DCC – Innovations
Highlight overview

New engineering efficiency features
+ Export backup file
+ Trace templates
+ Drive parameter compare
+ Extended signal (BiCo) handling
+ Filter parameters
+ Synchronized parameter / function view
+ Improved topology error diagnosis
+ Openness extensions



New SINAMICS features
+ OPC UA server
+ EPOS extensions
+ Unit switching
+ System Component Trace and Trace at fault

Safety Validation Assistant
- Test Safety functions from sensor to actor on TIA Portal project level
- Successor for Safety Activation Test

SINAMICS DCC
+ Support of DCC for G220
+ Indexing of publish PINs for G220
+ Up to 250µs cycle time for G220

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SINAMICS Startdrive Innovations
Export backup file

Export backup file – new in V20

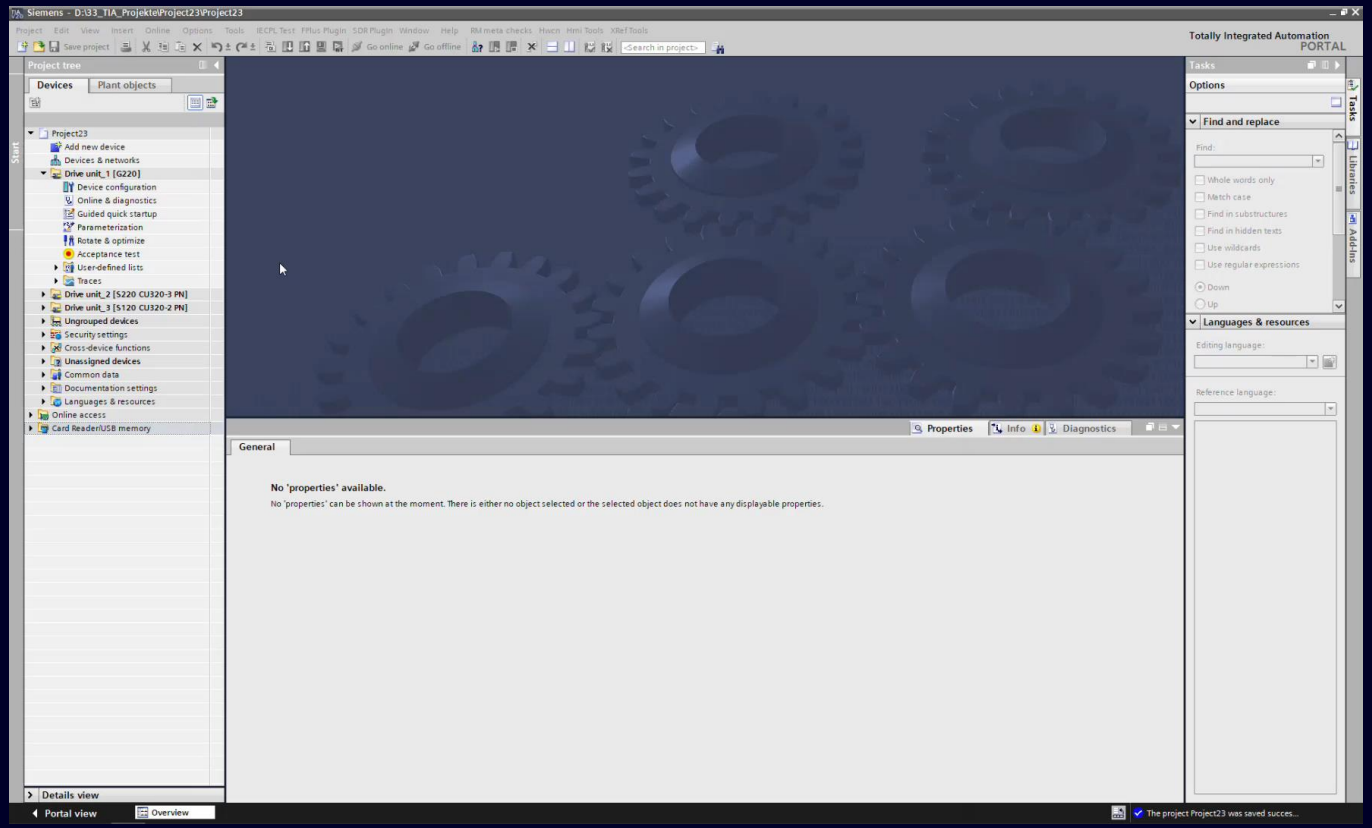
- Available for all drives as of V6.x
- Uses Card Reader function of TIA Portal
- “download” drive configuration directly to SD card or to local storage location on your PC for later reuse

Same backup file format – doesn’t matter if it was created…

- ✓ via backup function of online drive configuration (Webserver / Startdrive)
- ✓ via export backup function of offline drive configuration (Startdrive)

Can be restored…

- ✓ via Webserver / Startdrive restore function
- ✓ via SD card plugged to the drive



Export backup file functionality is part of the SINAMICS Startdrive Advanced license.

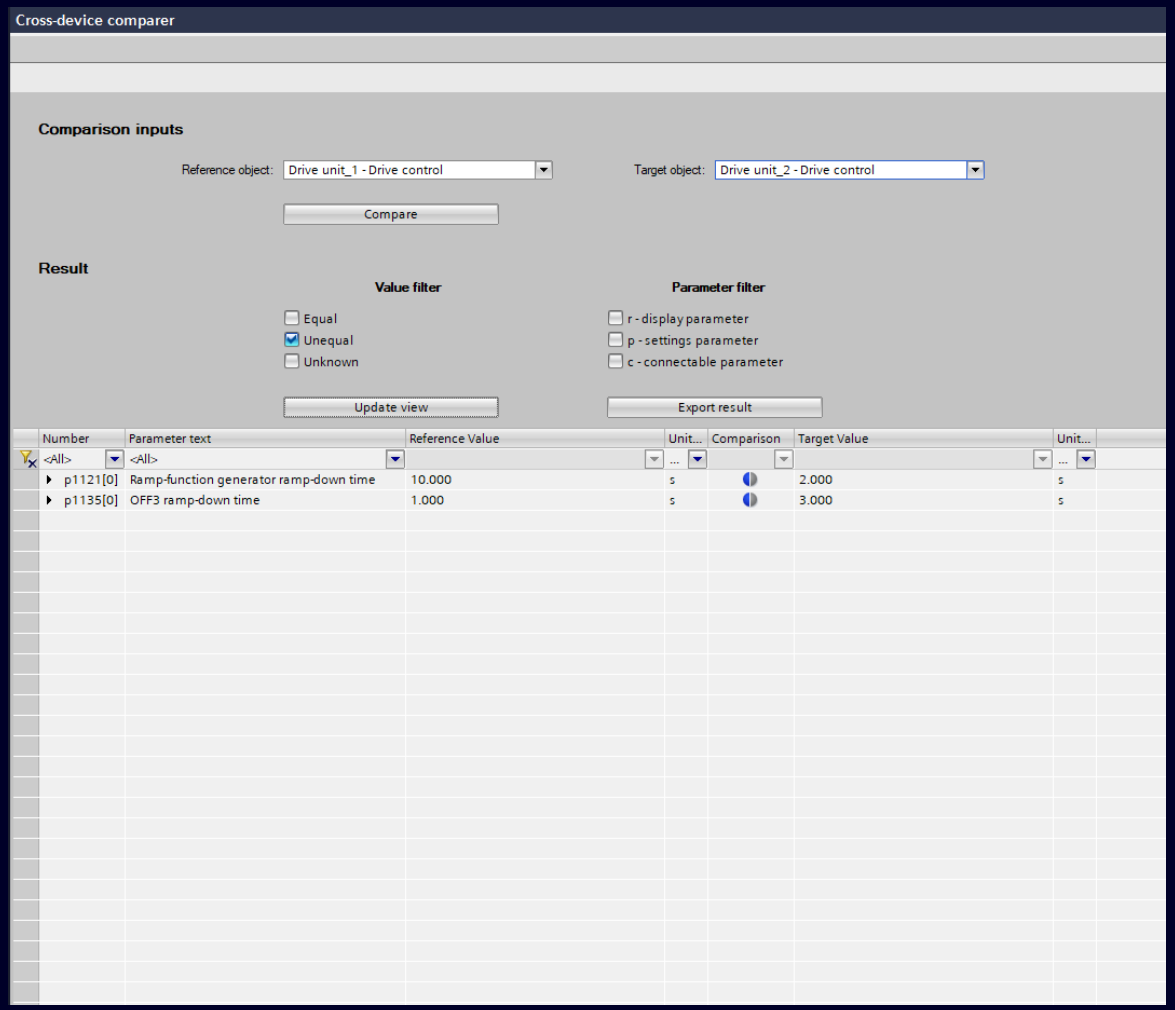
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SINAMICS Startdrive Innovations
Compare drives

Compare drives – new in V20

- Available for all drives as of V6.x and CU3x0-2 based drives
- Comparison of single axis drives or drive objects of multi axes devices
- “Compare” action creates snapshot of current values
- Compare online or offline configurations
- Filter for equal/unequal and r-/p-/c-parameters
- Change parameter values directly within compare result
- “Update view” for new filters or after parameter was changed by user (e.g. to make it equal)
- Export compare result as .csv file or User-defined list (UDL – with or without values from target or reference object)

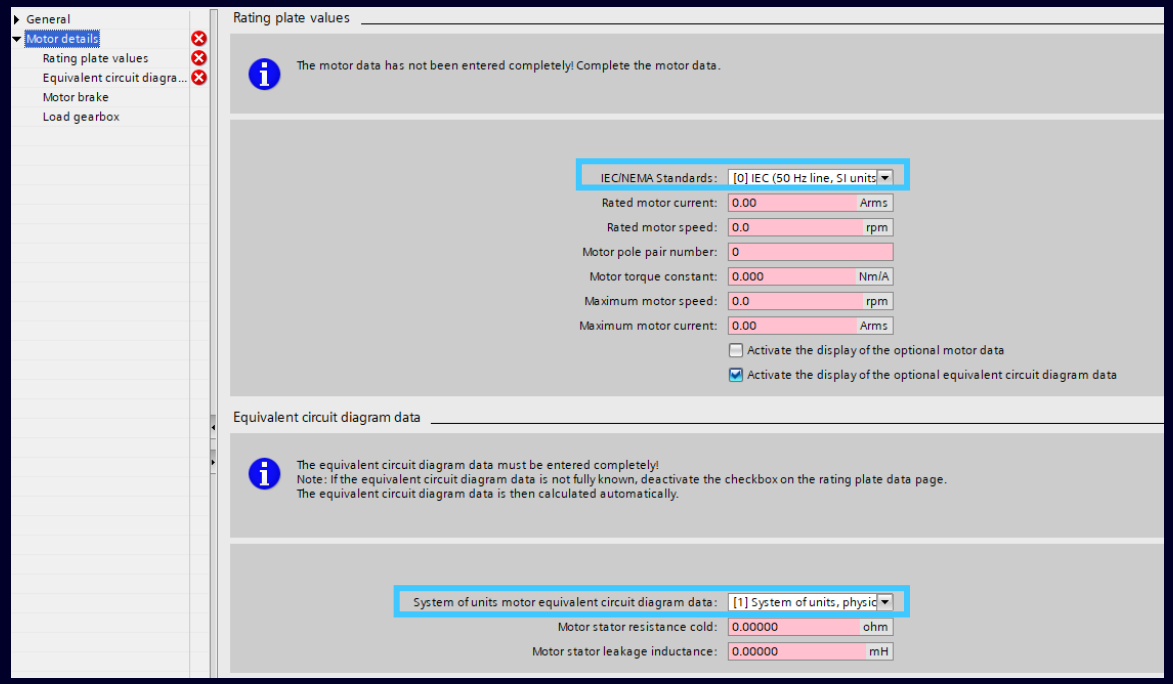


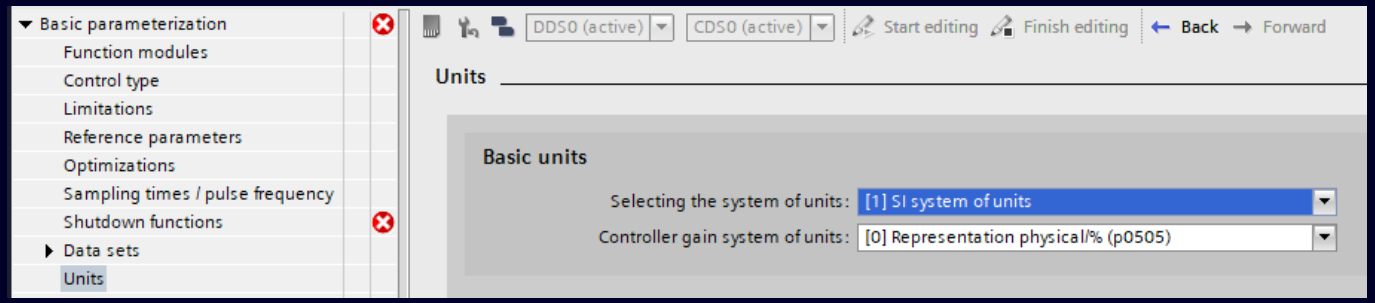
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SINAMICS Startdrive Innovations
Unit switching

Unit switching SI/US units – new in V20

- Available for
  - ✓ CU3x0-2 based drives
  - ✓ G220



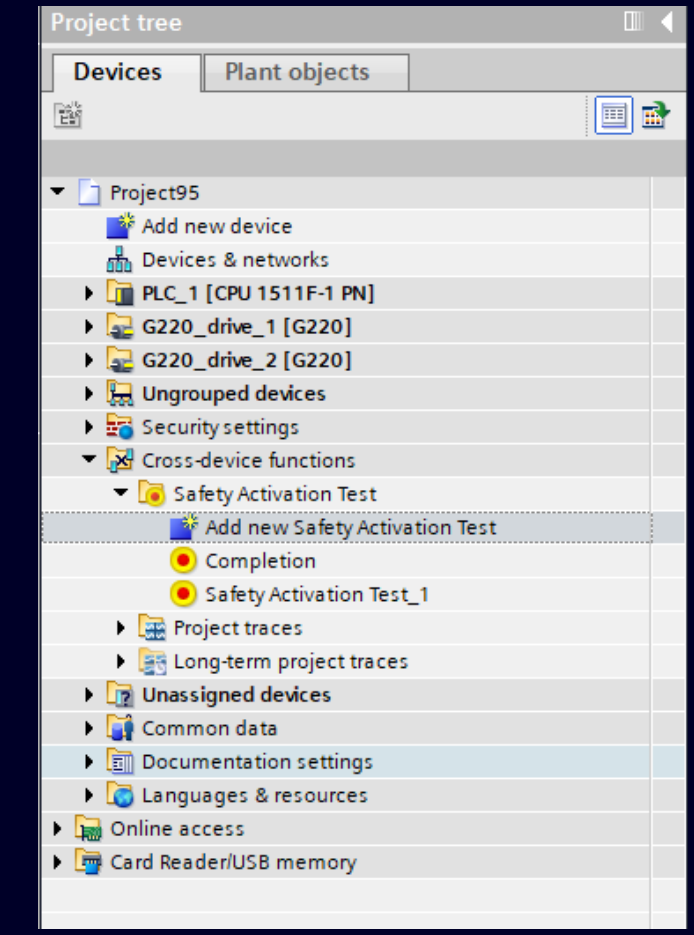


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SINAMICS Startdrive Innovations
NEW Safety Validation Assistant

Safety Activation Test on project level – NEW in V20

- Safety Activation Test was introduced in V17 to test and document the Safety control chain from sensor through PLC program to actuator. It had to be performed separately for each drive
- NEW in V20: Test on project level
- Advantage: Only one test case needed to check one Safety function for all devices in the project



Safety Activation Test on project level is available with the newly introduced Engineering license **Safety Validation Assistant**.

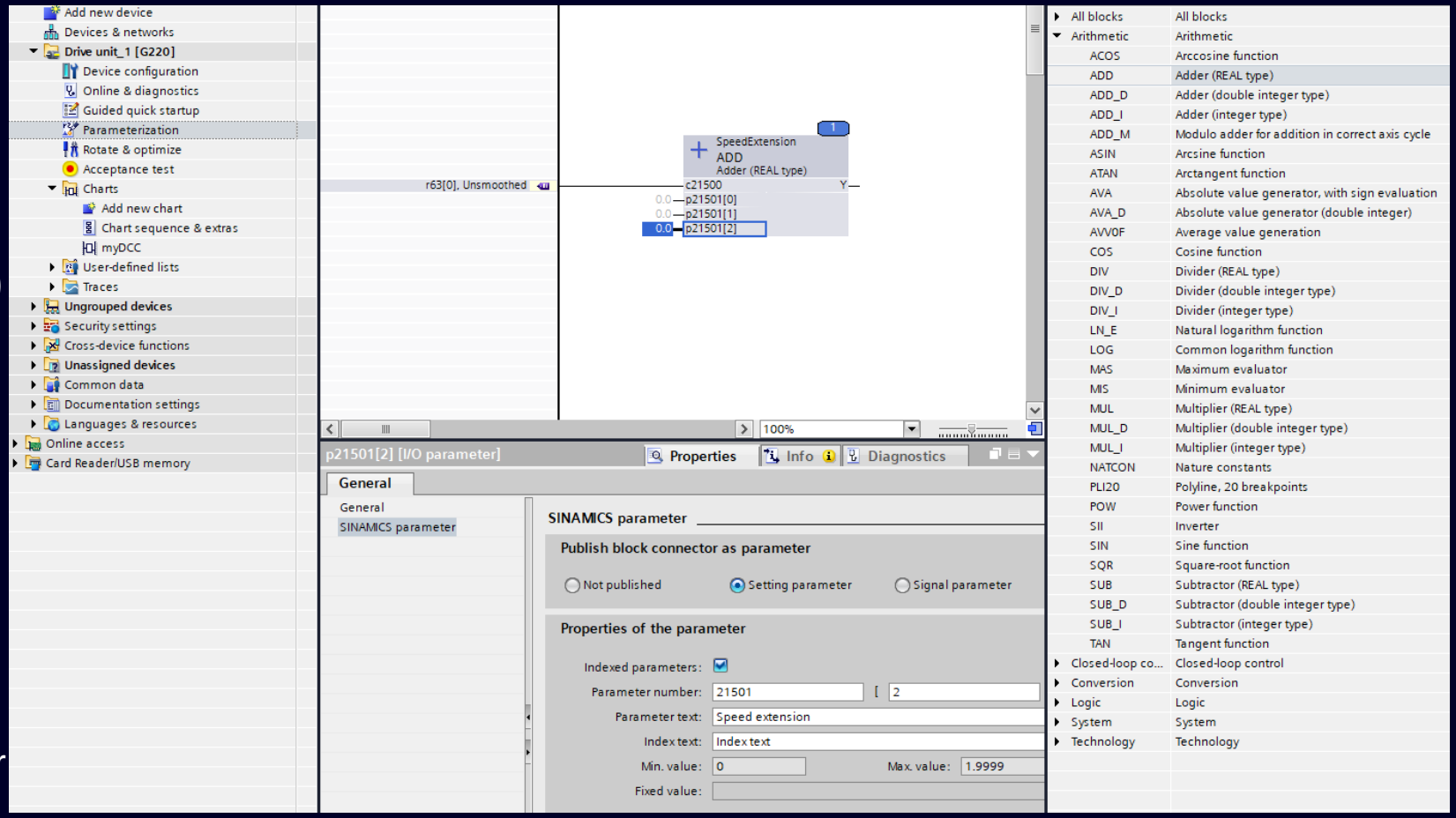
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SINAMICS DCC Innovations
Support of DCC for G220

SINAMICS Drive Control Chart (DCC) now available for G220 as of V6.4.

- Support of indexed parameters
- Up to 250µs cycle time for G220
- Additional block type available

Note:
For drives as of V6.x there is no DCC engineering license needed anymore for programming.
DCC functionality will be licensed as Runtime licenses depending on number of blocks and used functionality.



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TIA Portal V20
TIA Cloud Services

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V new
- Limited Sales release in USA

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

TIA Portal Options

- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
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- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

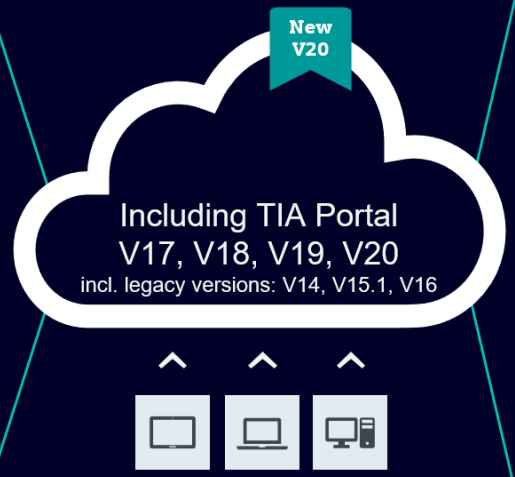
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TIA Cloud Services
TIA Portal Cloud

TIA Portal Cloud V5.0

Package

- STEP 7 Professional
- WinCC BCA / Unified
- STEP 7 Safety
- PLCSIM Advanced
- StartDrive Advanced
- SiVArc
- SINUMERIK STEP 7 Toolbox
- SINAMICS DCC
- SINETPLAN
- Test Suite
- Energy Suite
- SIMIT Demo
- SIMATIC SCADA Export



License models

Trial – 21 days
- 21 days limited use

Subscription pay per use
- pay only for session time

Subscription monthly
- fixed price, unlimited access

Subscription annually
- fixed price, unlimited access
- including SITRAIN access learning membership

Certificate for 365 days
- get activation code for user assignment
- full access for 365 days, no auto-renewal

New: Certificate for 100 hours
- get activation code for user assignment
- full access with 100 hours of usage credit

More information about TIA Portal Cloud is available at Industry Support page ID 109794456.

TIA Portal Cloud is an efficient SaaS offering, that enables you to work anywhere at any time!

What is new?

TIA Portal Cloud V5.0 (12/2024)
- Integration of TIA Portal V20
- Keep TIA Portal V15.1 and V16 as legacy versions

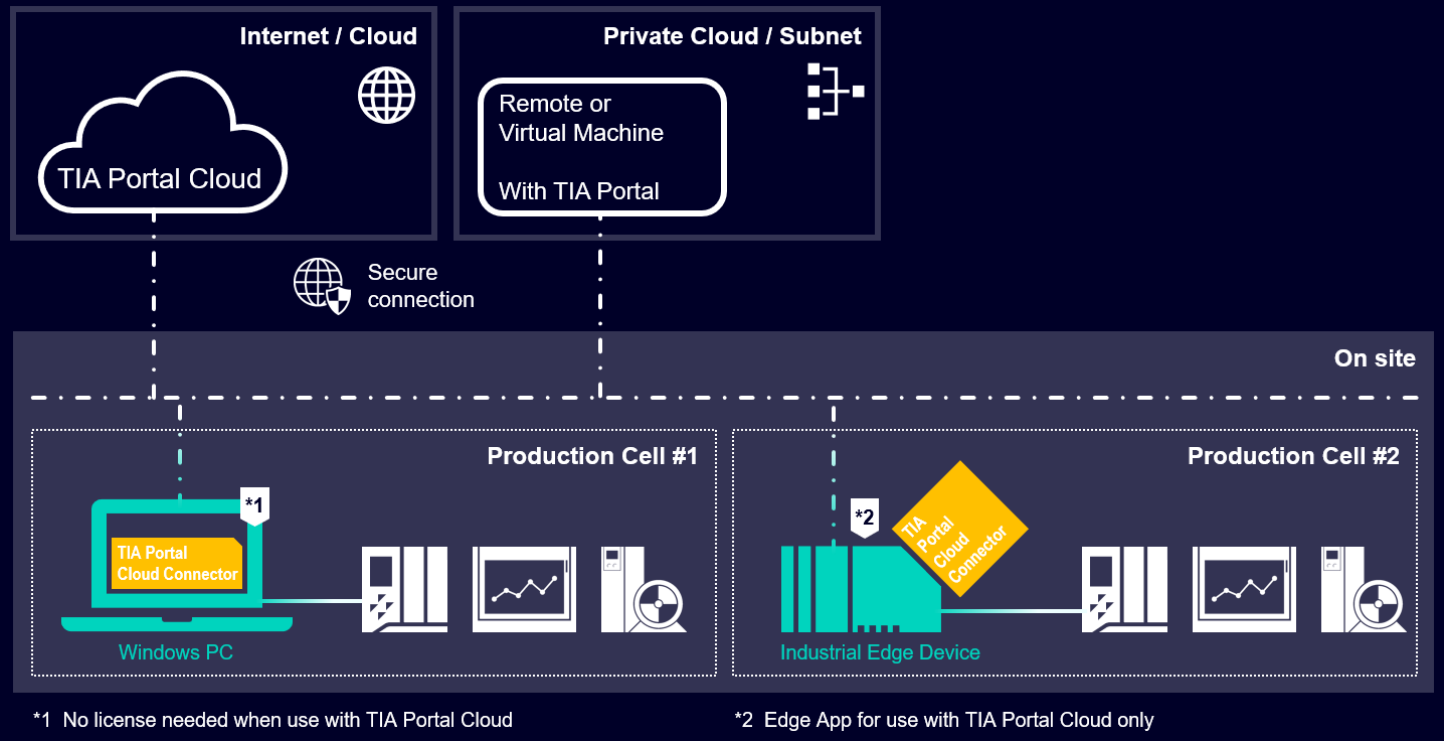
TIA Portal Cloud V4.6 (08/2024)
- Extended hibernation support for your instances

TIA Portal Cloud V4.3 (05/2024)
- Improved WebUI with uniform navigation, clear selection and efficient use
- Basic hibernation support

TIA Portal Cloud V4.2 (03/2024)
- Support of TIA Project-Server Cloud

TIA Portal Cloud V4.1 (01/2024)
- Authentication via Siemens ID
- Updated instance toolbar design

TIA Cloud Services
TIA Portal Cloud Connector



The TIA Portal Cloud Connector enables full access to SIMATIC hardware, if the TIA Portal is located in a different subnet or in a cloud environment.

Features

- Access to all online functionalities
- High-performant download to devices
- Secure connection via https
- Easy integration as Industrial Edge App
- Integrated access management for TIA Portal Cloud users

More information and the setup of the latest version are available at Industry Support page ID 109780755.

TIA Cloud Services
TIA Project-Server Cloud

Make your TIA Portal projects available in the cloud.
Enables efficient team engineering of projects with the TIA Portal or TIA Portal Cloud - anywhere, anytime.

With the **TIA Project-Server Cloud** you have access to your TIA Portal projects and libraries from different locations for collaborative work across company boundaries.

Benefit

- Project storage and user management provided by the TIA Project-Server in the Industry Premium Portal.
- Direct access to data storage from the TIA Portal, no time-consuming sending of data or coordination of changes.
- Access from TIA Portal engineering stations as well as from the TIA Portal Cloud.
- Dedicated resources for performance and data security.
- Easy integration of suppliers, without opening the own IT structures.
- Management of the Server and the TIA Portal projects via a comfortable web interface.



Cooperative engineering for TIA Portal Projects and Libraries in the TIA Portal Cloud

For more information on TIA Project-Server Cloud, please follow the link: TIA Project-Server Cloud

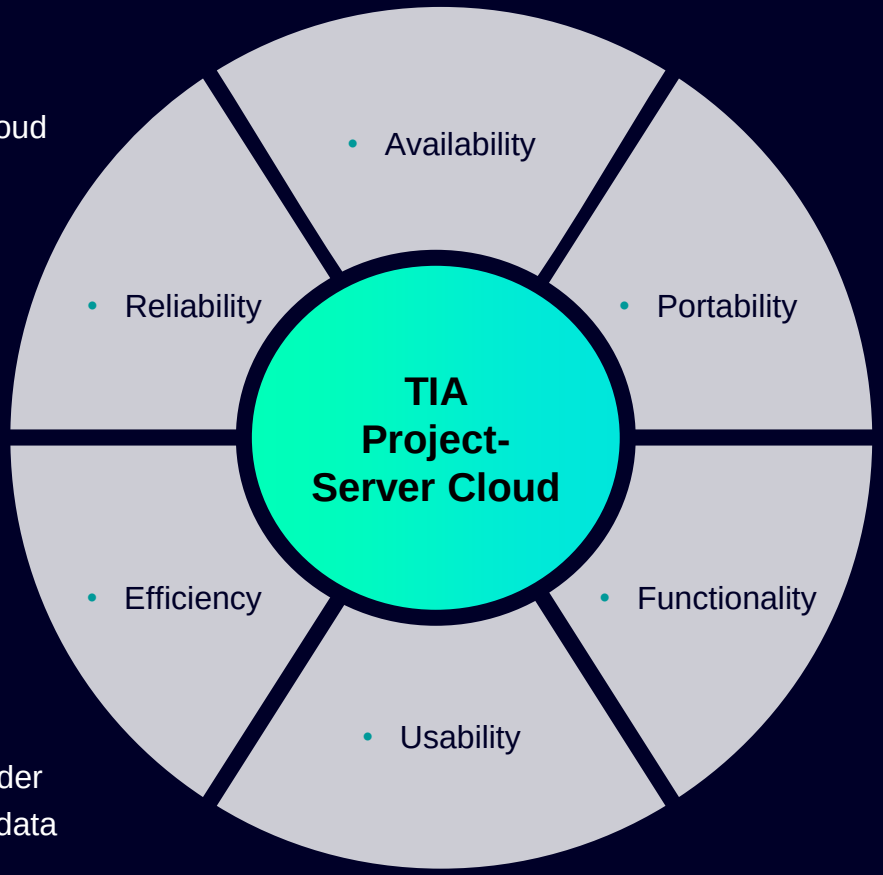
TIA Cloud Services
Added values from TIA Project-Server Cloud

Use Case: Work together effortlessly, regardless of company boundaries.

Availability
Available from everywhere at any time
- use with on-premise TIA Portal and TIA Portal cloud
- Stable accessibility of the colocation center
- High giga bit network bandwidth

Reliability
Guaranteed service level
- Average annual availability of at least 99.9%
- 24/7 monitoring service

Efficiency
Secure and fast environment
- Dedicated server with own resources for each order
- High level of data security with full control of the data



Portability
Zero IT effort and easy entry
- no installation, maintenance or update effort
- no hardware, no Windows server license needed

Functionality
Managed service
- Server fully managed by Siemens
- No shared virtual machines, each user gets their own virtual machine.
- Virtual machines with the latest security patches ensures that system software and server services function properly

Usability
User experience
- Simple administration via Web GUI
- Same known experience for the users from TIA Portal point of view with seamless integration

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TIA Project-Server Cloud
How to get access

Different offerings for different demands

10-hours certificate
Non-self-extended 10-hours credit with 100 GB project memory.
Interruptible can be combined into one credit period term (e.g. 4x10h = 40h).

→ As Certificate of License via Industry Mall: 6ES7804-0PP01-3YA8 (in preparation)

31-days certificate
Non-self-extended 31-day certificate with 100GB project memory.

→ As Certificate of License via Industry Mall: 6ES7804-0PP01-2YA8 (in preparation)

365-day certificate
365-day certificate with 250GB project Memory. No auto-renewal.

→ As Certificate of Contract via Industry Mall: 6ES7804-0PP01-1YA8

Monthly subscription
Self-renewing monthly subscription with unlimited access and 100GB project storage.

→ As Certificate of License via Industry Mall: 6ES7804-0PP01-2YA0

Annual subscription
Self-renewing annual subscription with unlimited access and 250GB project storage.

→ As Certificate of Contract via Industry Mall: 6ES7804-0PP01-1YA0

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S7-1200 G2

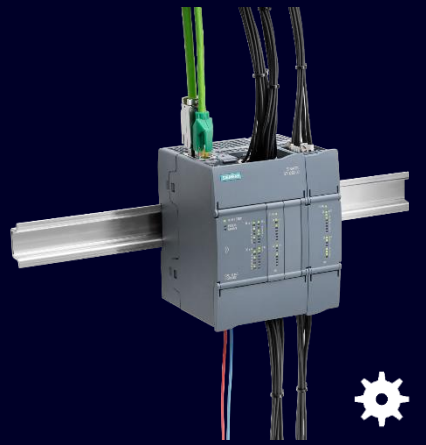
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S7-1200 G2
Overview









Seamless Scalability

- Cost-optimized standard and fail-safe hardware portfolio
- HW: ~25% space reduction
- Fail-safe integrated
- Memory expansion

Flexible Machine Safety

- Integrated in the complete range
- Improved F-IO Portfolio with F-SBs and mixed I/O modules
- Integrated in STEP 7 Basic

Increased Performance

- PROFINET:
  31 devices with IRT
- 8 High-Speed-Counter
- Near Field Communication (NFC) and App

Efficient Motion Control

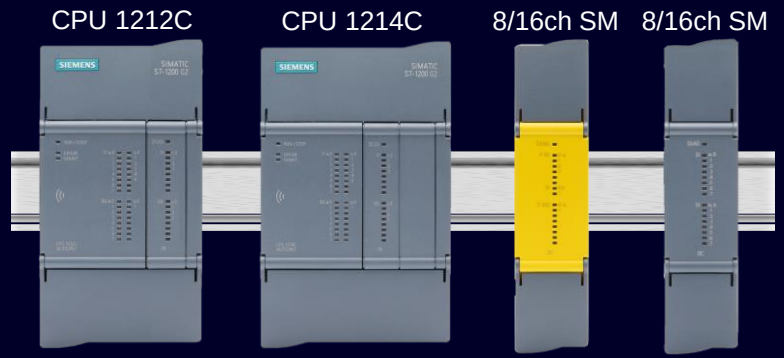
Kinematics, Multi Axis Control, and Single Axis Control

Scalable, powerful portfolio for the basic automation segment

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S7-1200 G2
Overview

New HW design



Increased performance and seamless scalability

- Enhanced processing power, dedicated communication performance and more memory
- Up to 31 PROFINET devices and synchronized program execution with PROFINET IRT
- Near Field Communication (NFC) for commissioning and diagnostics support
- Optimized scalable hardware portfolio and seamless scalability across all SIMATIC controllers

Flexible Machine Safety

- Fail-safe integrated in the complete range (PROFIsafe communication, I/Os)
- Improved F-I/O portfolio (fail-safe signal boards, fail-safe signal modules with mixed I/Os)
- Fail-safe & Motion Engineering integrated in TIA Portal Basic

Efficient motion control

- Kinematics
- Multi Axis control
- Single Axis control



Expansion

	EM	RAM Data	RAM Program
CPU 1212C	6 in total therein 3 CM/CP	500 k	150 k
CPU 1212FC		500 k	200 k
CPU 1214C	10 in total therein 3 CM/CP	750 k	250 k
CPU 1214FC		750 k	300 k

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Fail-safe SIMATIC S7-1200 (G2): No more separate Safety license from V20 onwards
STEP 7 Safety Basic will be discontinued from V20 onwards

Until TIA Portal V19

Hardware:
S7-1200 F-CPU/F-DI/F-DQ

Software:
- STEP 7 V19 Basic (or Advanced)
- STEP 7 V19 Safety Basic

Starting with TIA Portal V20

Hardware:
S7-1200 (G2) F-CPU/F-DI/F-DQ

Software:
STEP 7 V20 Basic (or Advanced)



SIMATIC S7-1200



SIMATIC S7-1200 G2

Scalable automation solutions

Scalable portfolio for standard and machine safety functions.

Seamless system integration

Seamlessly integrated in STEP 7 without need for separate license.

Reduce license costs

- Reduce entry costs
- Especially customers requiring just few F-PLCs

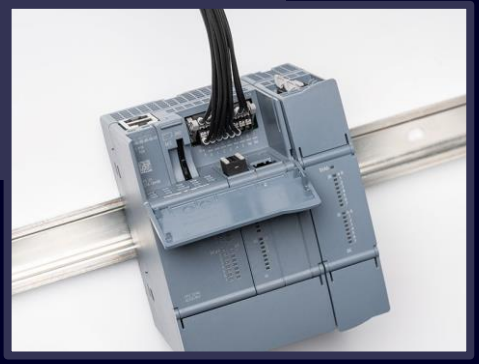
Hints

- V18/V19 Safety Basic licenses will still be available
- Future S7-1200 (G2) Hardware will use similar principles
- SUS contracts for Safety Basic will be discontinued end of 2024

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S7-1200 G2
Design and Handling





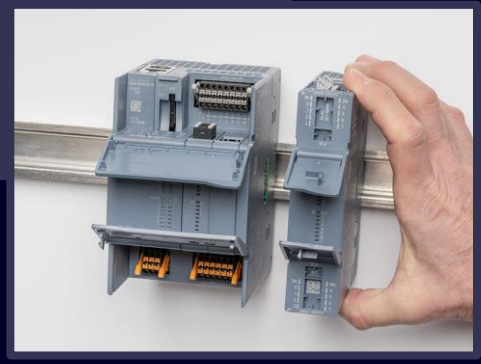
Memory Card access, 2xPN Ports and improved signal board concept (up to two SBs).





Removable high(er) density terminal blocks with push-in wiring for ease of use → non-contact pre-wiring position.





DIN rail footprint reduced by ~ 25%. Single, reliable bus connection system for both SMs and CMs.

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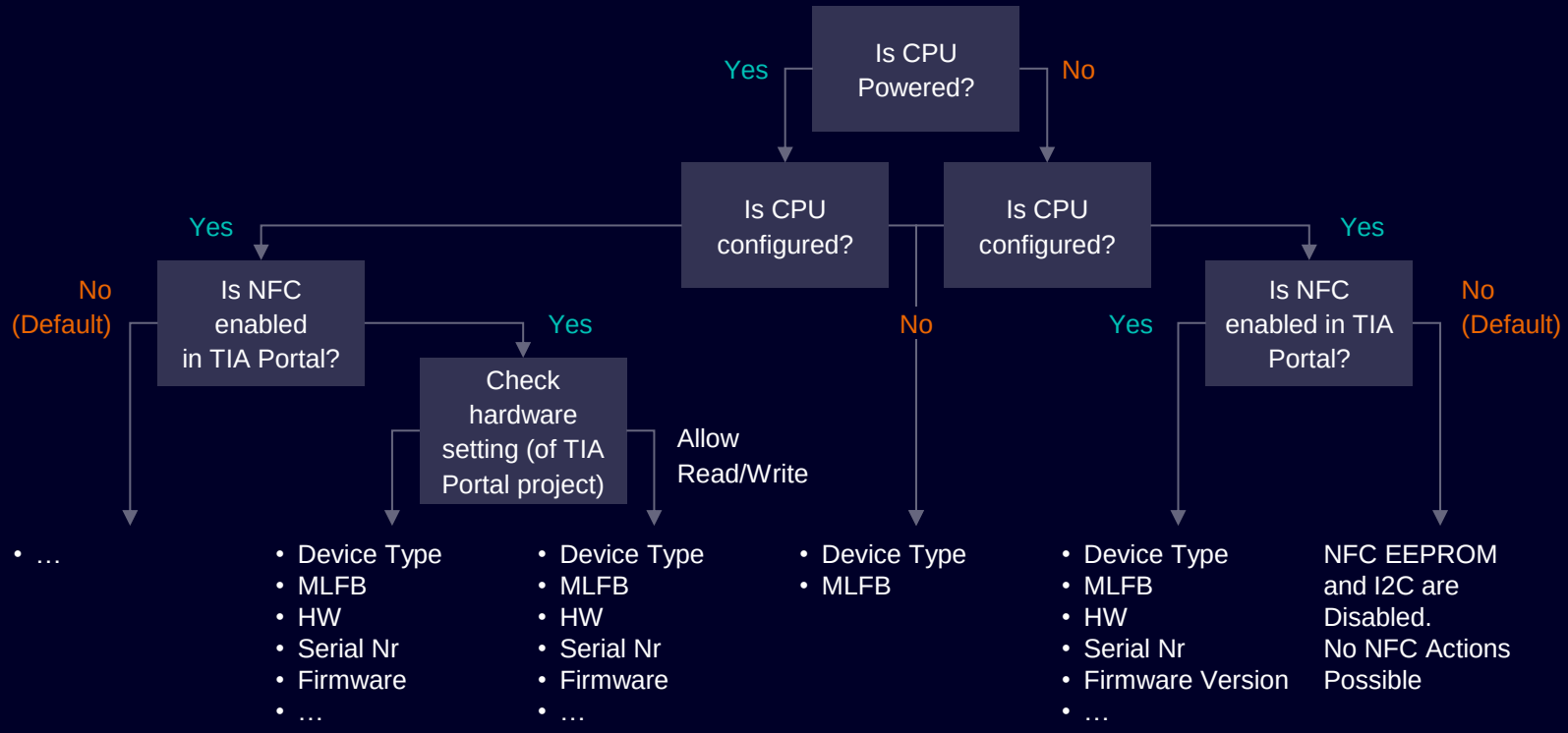
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S7-1200 G2
NFC function



Near Field Communication (NFC)

- Gather Information without having to power the Device
- Read/Write Application and Diagnostic Data (based on configuration)

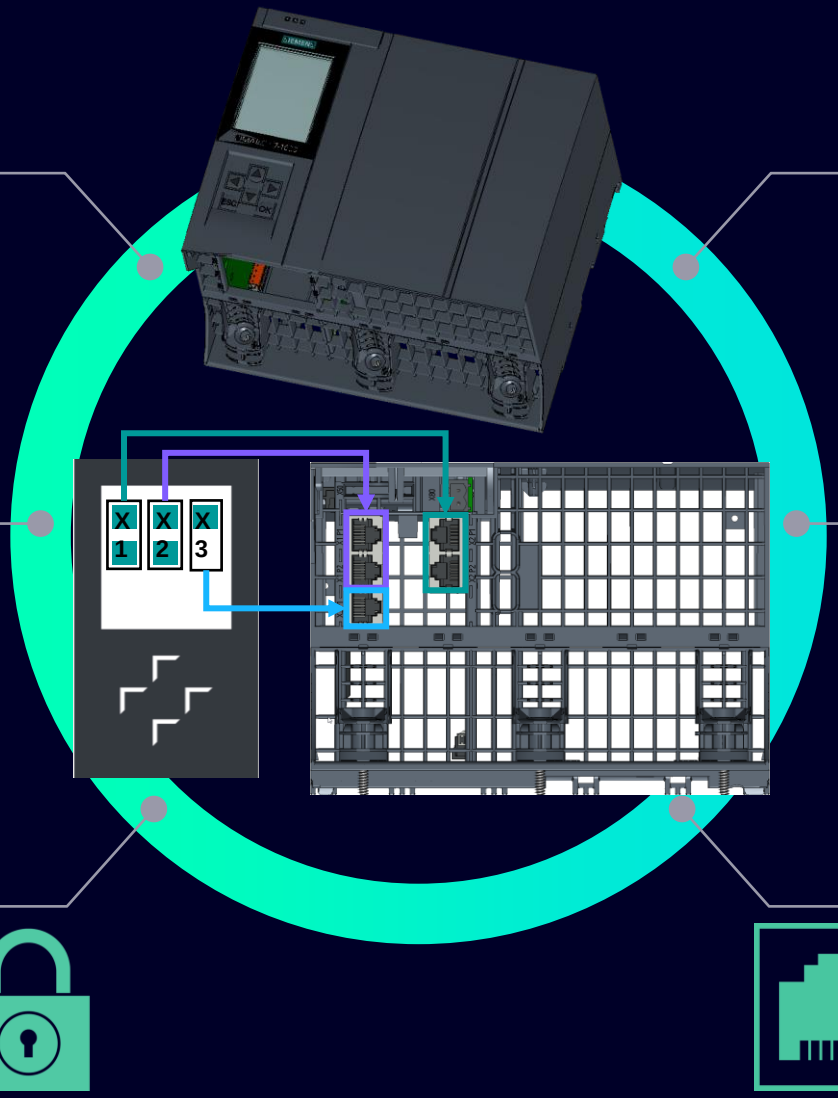


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SIMATIC Controller S7-1500 standard & F

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SIMATIC S7-1500 1517(F)/1518(F) CPUs
New Hardware, Performance & Memory with FW V4.0 and TIA Portal V20



Program Memory (Mbyte)
- 100% more program memory

Data Memory (Mbyte)
- 150% more data memory for 1518 CPU
- 500% more data memory for 1517 CPU

Security Integrated
- Secure boot
- User management and access control
- Recording Security events (Syslog)
- Protection functions
- Secure communication
- Certificate management

Program Performance
- More than 200% performance increase

Communication Performance
- Up to 200% higher communication performance

Interfaces
- Two PROFINET IRT Interfaces (X1 & X2), each with two RJ45 Ports *
- 512 RT or 64 IRT IO-Devices or 256 IRT IO-Devices with DFP via each interface *
- G-Bit Interface (X3) for both CPUs

*except H and HF CPUs

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SIMATIC Hardware
New Hardware for S7-1500 1517(F)/1518(F) CPUs

New mechanical design

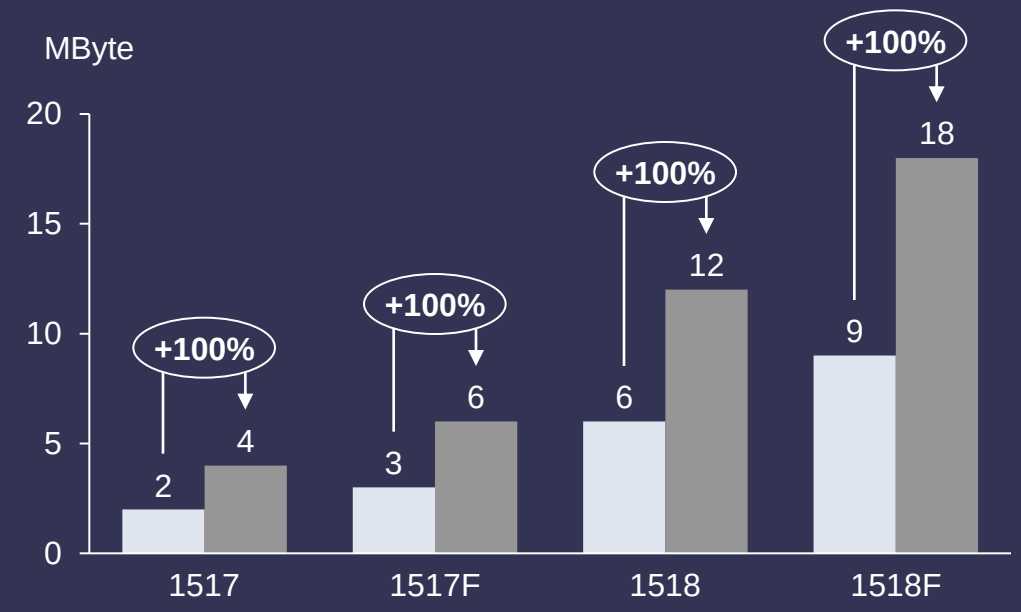
- The display is now integrated into the CPU like in the new 1515/1516 CPUs
- Installation dimensions remain identical
- RUN/STOP switch is replaced with RUN/STOP buttons
  - No more "cancelling" of the RUN/STOP switch
  - "STOP ACTIVE" indicates that the CPU was switched to STOP via the STOP button
  - Memory reset/Reset operation: Identical as before
- Display can now be read – even when the cover is open
- Mechanical manipulation protection is retained
- New Display implementation
    - No separate Display FW needed



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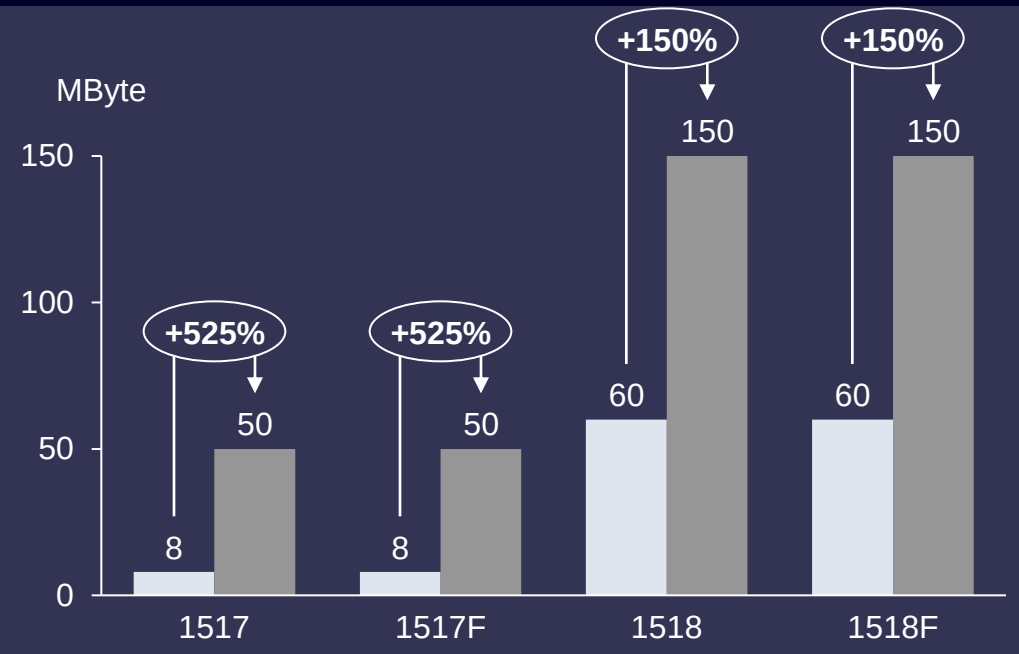
SIMATIC Hardware
New Hardware for S7-1500 1517(F)/1518(F) CPUs

+100% more program- and data memory



Program memory

- **more resources for future customer application extensions**



Data memory

FW V3.1 (current article no.) FW V4.0 (new article no.)

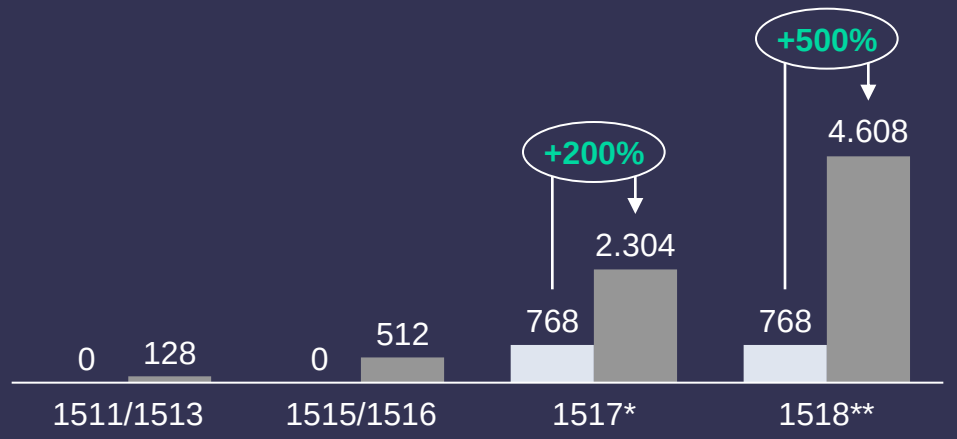
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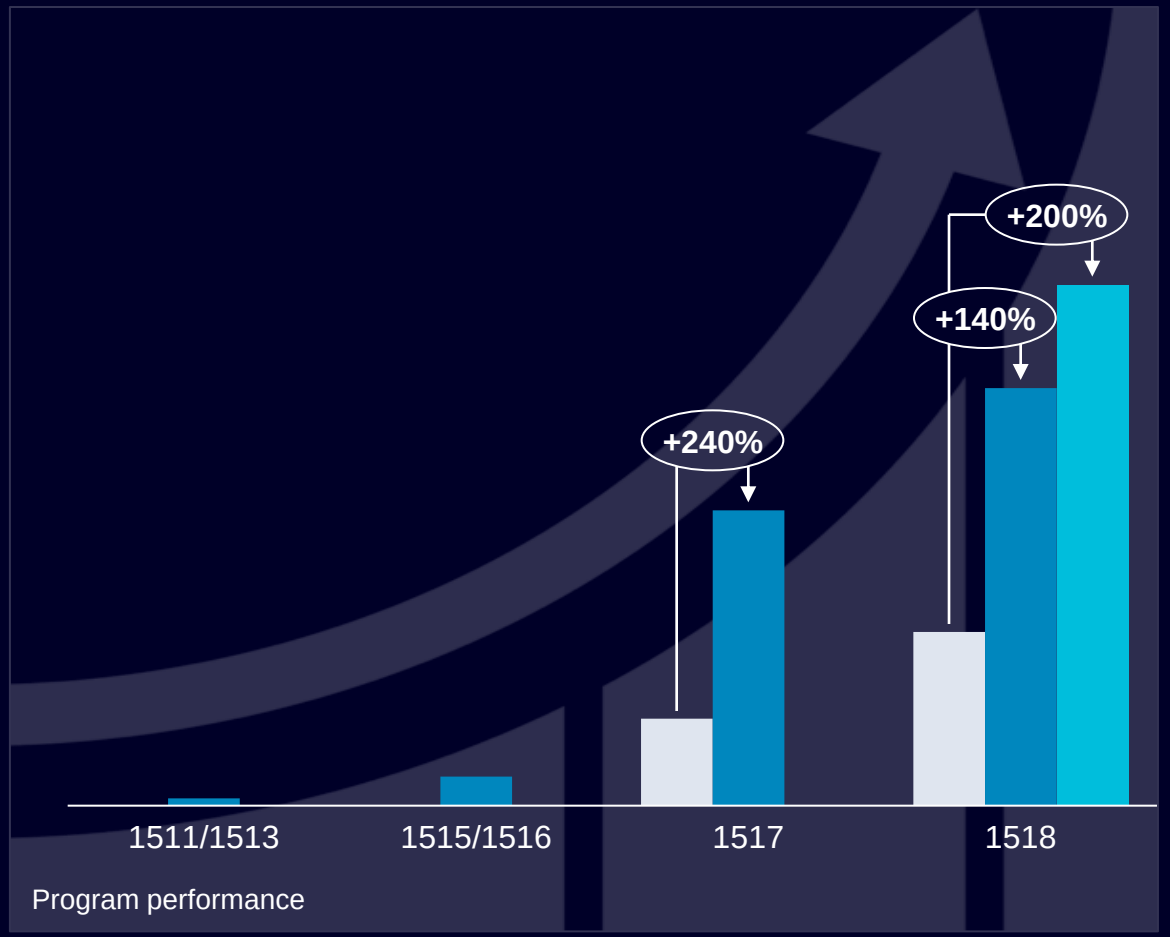
SIMATIC Hardware
New Hardware for S7-1500 1517(F)/1518(F) CPUs

- **Program performance increase up to +200%**
  - Easier controller selection
  - More customer use cases can be realized

- **Retain Memory increase**



Retain memory in kByte



Program performance

FW V3.1 (current article no.) Boost Mode (<=50°C)
FW V4.0 (new article no.) ***

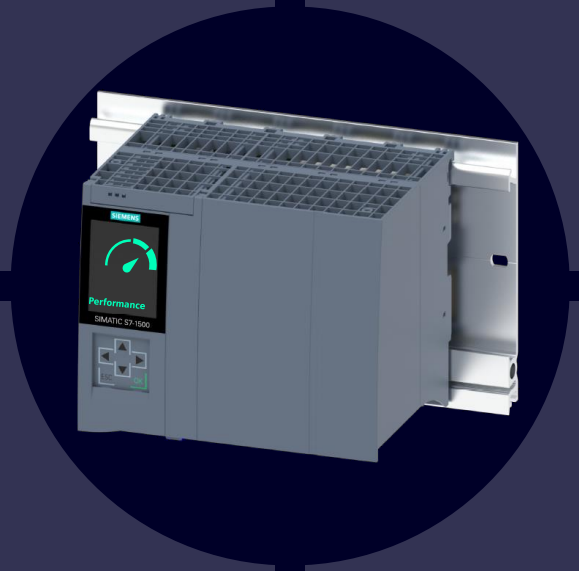
* 50 MB with PS 60W 24/48/60V DC HF
** 100 MB with PS 60W 24/48/60V DC HF
*** measured values

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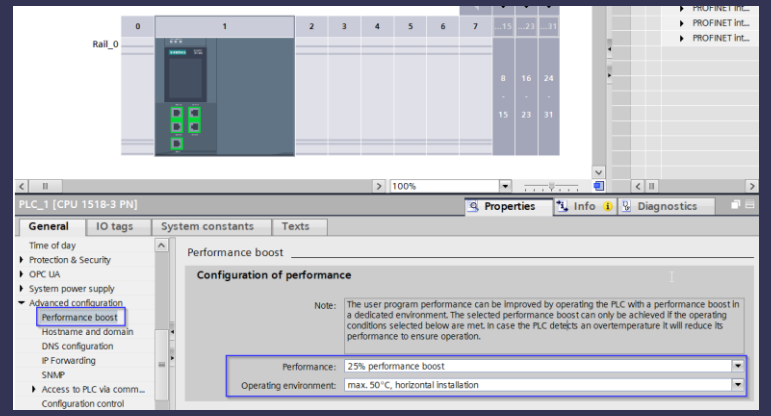
SIMATIC Hardware
Additional performance boost for 1518(F, T, TF)-3 PN CPU

Performance boost

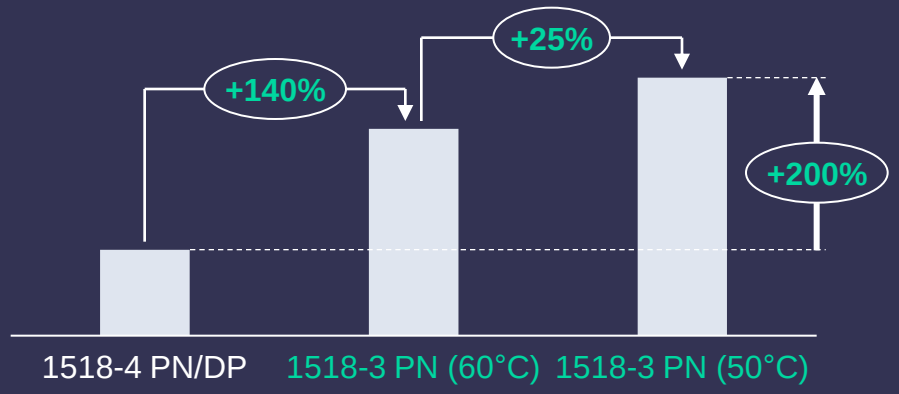
- 25% additional performance increase
- At ≤ 50°C ambient temperature
- Configurable in TIA Portal
- Horizontal mounting only



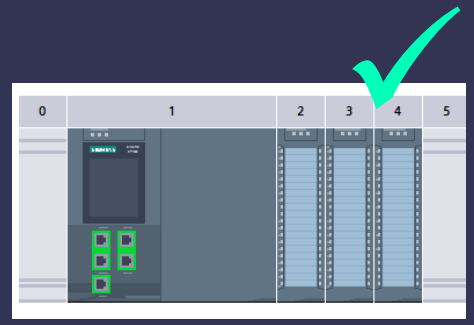
Configuration in HW Config

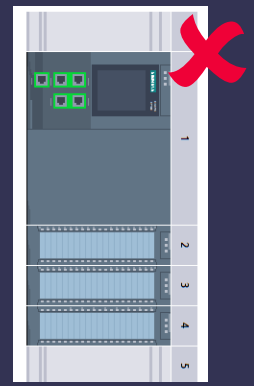


User Program performance



Mounting





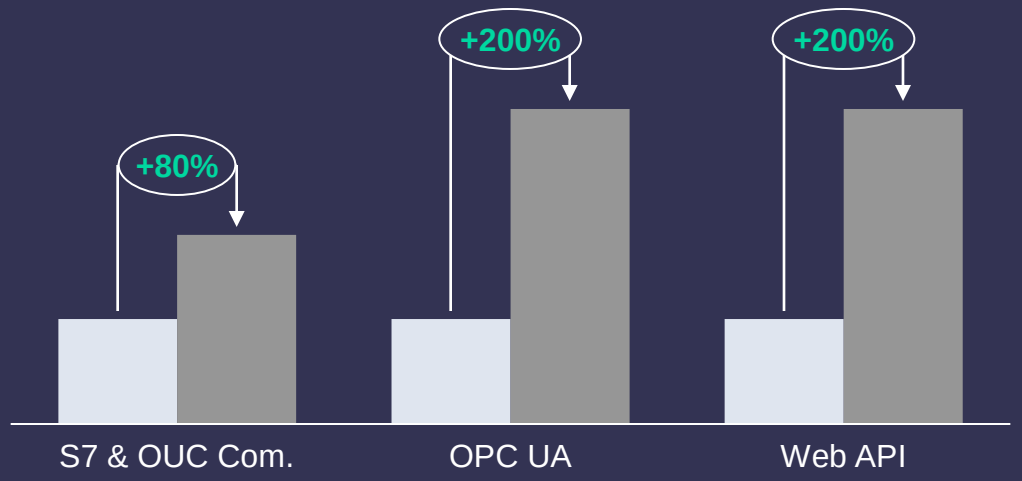
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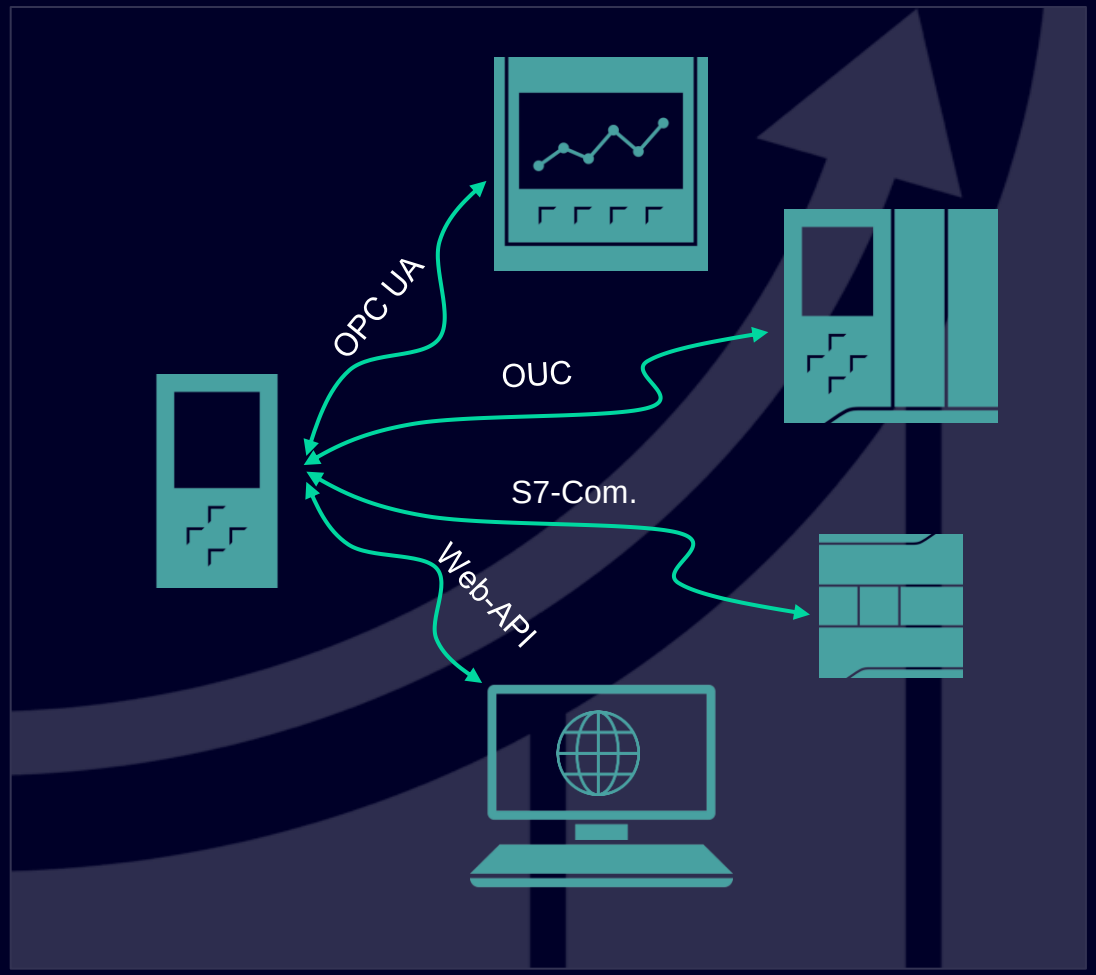
SIMATIC Hardware
Communication performance of the new 1517(F)/1518(F) CPUs

S7 & (secure) OUC communication performance
- **up to +80% performance increase**

OPC UA
- **Up to +200% performance increase**

Web-API (Read/Write)
- **Up to +200% performance increase**



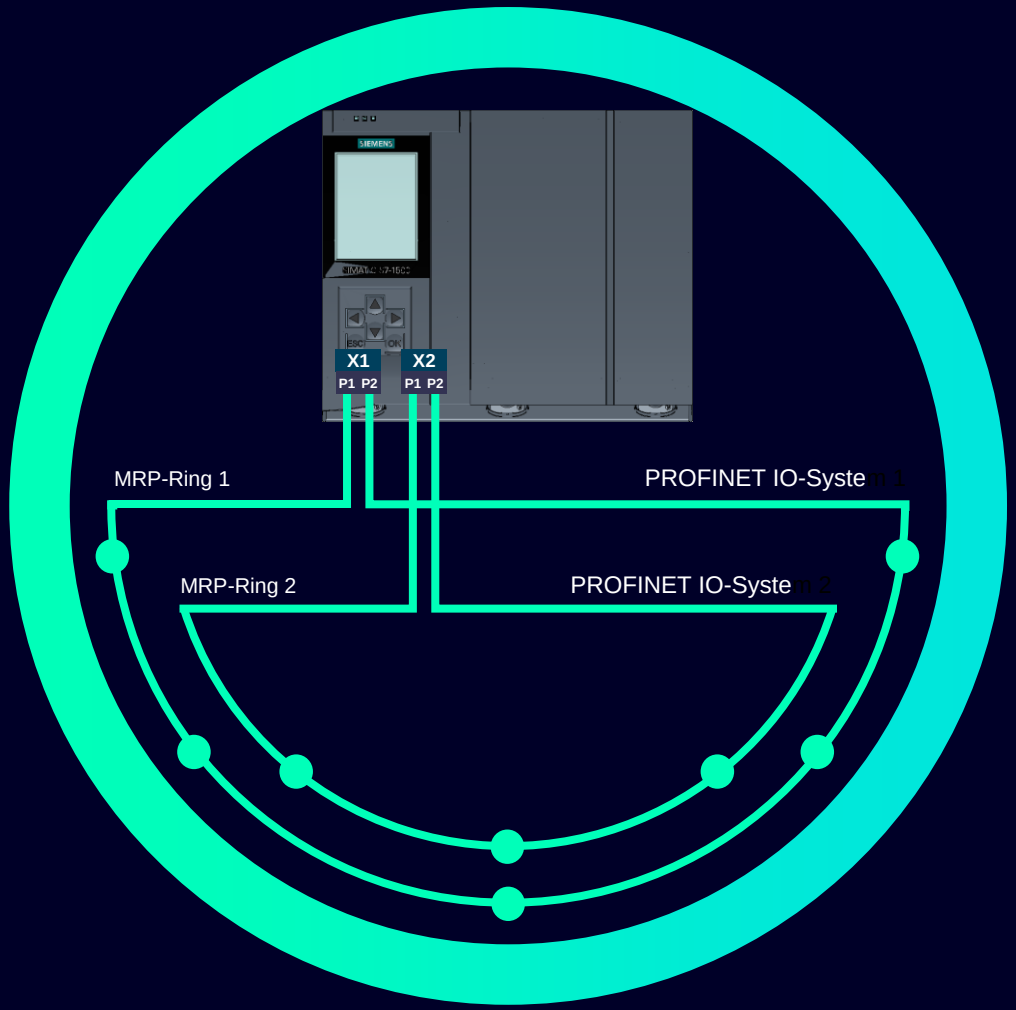


FW V3.0 (current article no.) FW V4.0 (new article no.)

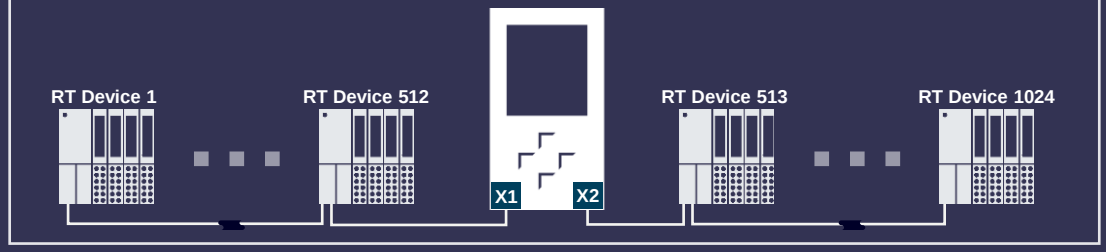
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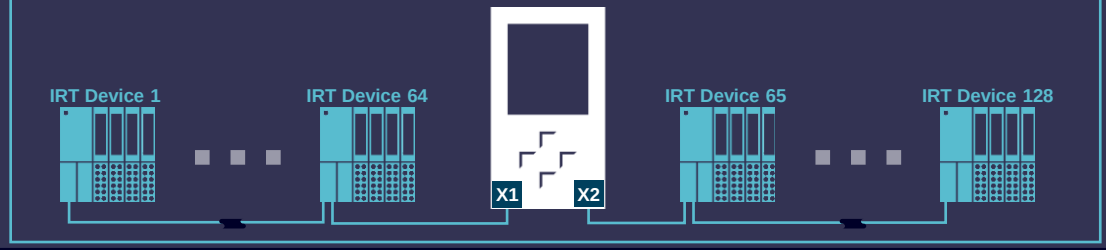
SIMATIC Hardware
Usable IO-Devices with the new 1517(F)/1518(F)



Max. count of RT IO-Devices: 1024 (512 on X1 + 512 on X2)



Max. count of IRT IO-Devices: 128 (64 on X1 + 64 on X2)



Max. count of IRT IO-Devices with DFP: 512 (256 on X1 + 256 on X2)



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SIMATIC Hardware
Increase of quantity structure

Max. number of blocks (DB+OB+FC+FB) • CPU 1517 from 12.000 → 20.000 • CPU 1518 from 20.000 → 40.000	• Better modularization of customer projects • Efficient use of increased program memory
Max alarming instances loadable in RUN • CPU 1517/1518 from 10.000 to 20.000	• Higher number of alarms can be configured and loaded in RUN of the CPU
Size of the Textlist Container (Mbyte) • CPU 1517/1518 from 7,5 (10*) to 50	• Higher amount of alarm messages in three languages can be loaded in the CPU
Number of available Motion Control resources for technology objects • CPU 1517 from 10.240 → 20.480 • CPU 1518 from 10.240 → 30.720	• More axes can be controlled by the CPU with high performance • More complex motion applications can be realized

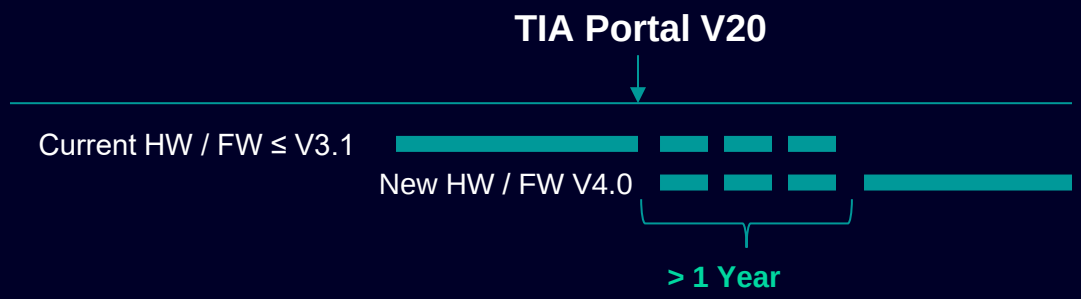
* With FW V3.1

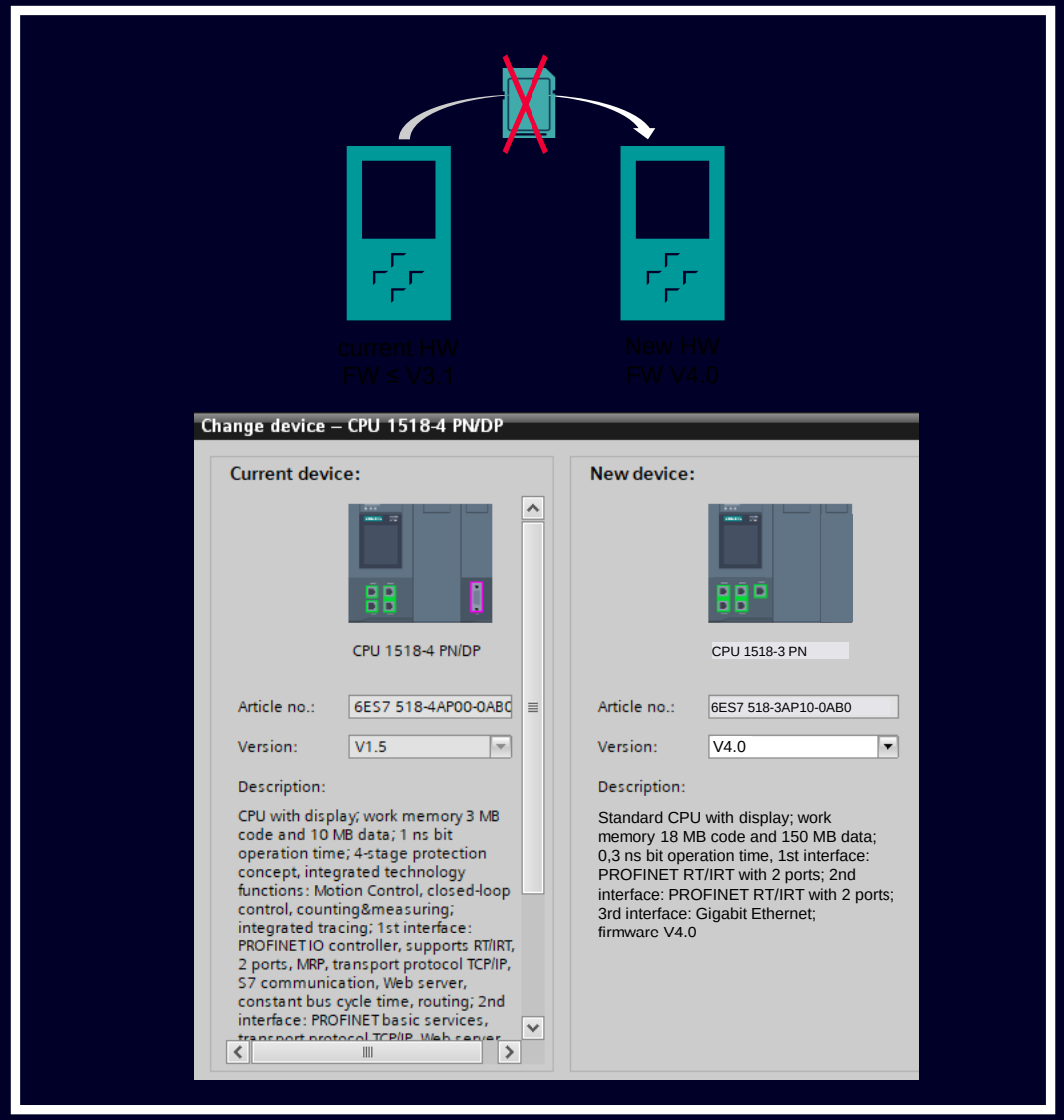
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SIMATIC Hardware
Compatibility of CPU 1517(F)/1518(F) with new HW

- FW V4.0 only for new article numbers
- No PROFIBUS Interface on board, additional PROFINET Interfaces (Second RJ45 port for X2 and G-Bit X3) → No spare part compatibility
  - To connect PROFIBUS devices a CM 1542-5 or CP 1542-5 can be used
- Fully functional compatible (except PROFIBUS DP). Step7 project can be used in the new CPU after “change device” in HW config.

- Parallel delivery of the old and new HW for more as 1 Year:

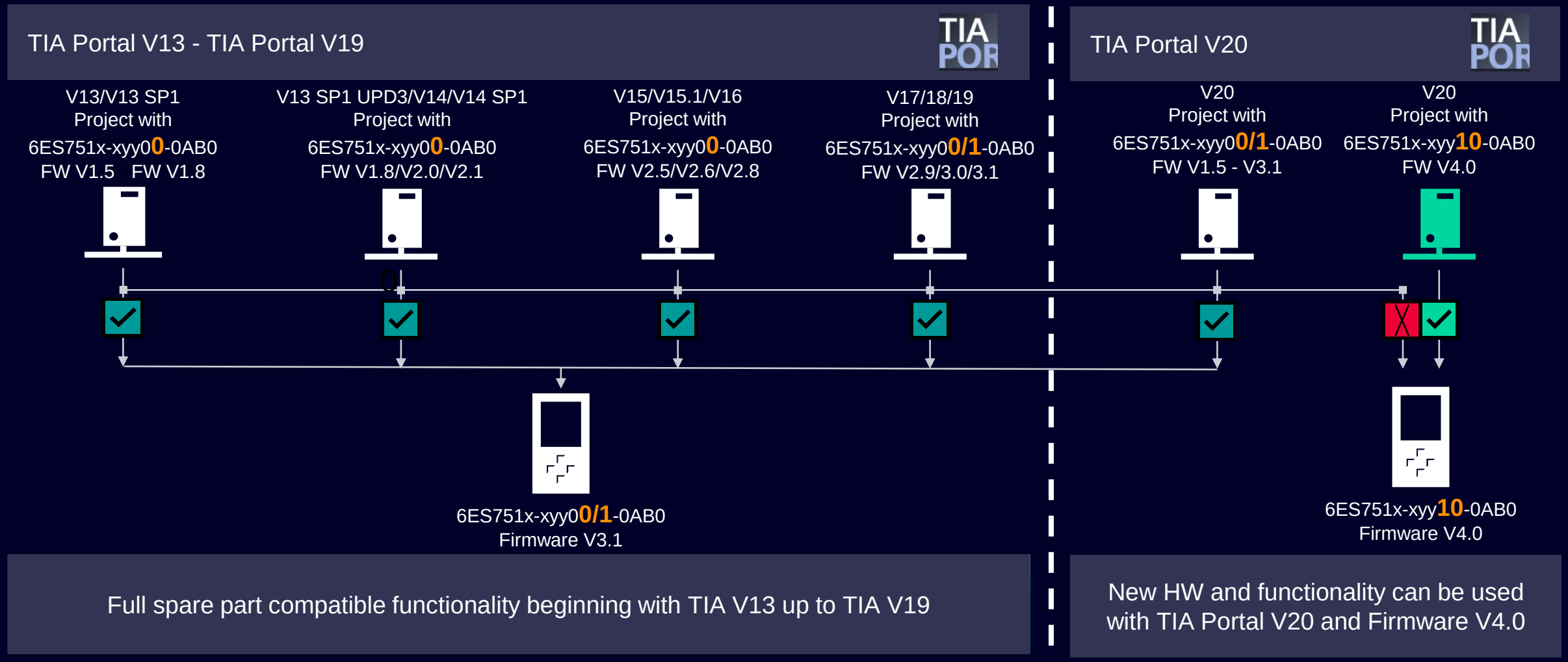




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SIMATIC Hardware
Spare parts compatibility S7-1500 (>= 1517(F)) – FW 4.0 with older TIA Portal versions



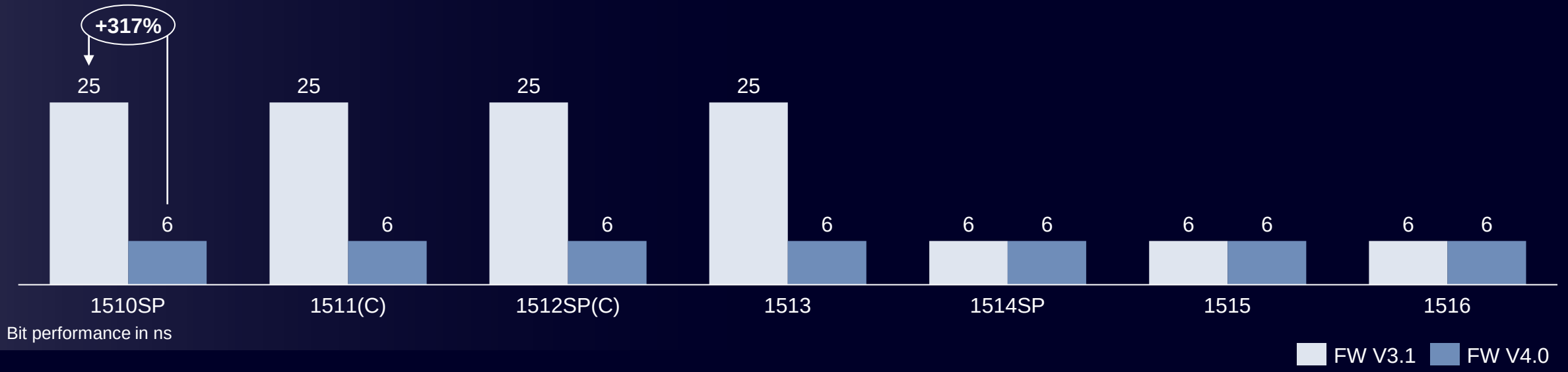
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SIMATIC Hardware
S7-1500 1510SP(F) – 1513(F) CPUs – Performance increase with FW V4.0

- TIA V18 and new HW for S7-1500 CPUs ≤ 1516: Increase of the performance with simultaneous reduction of performance levels from 6 to 2
- TIA V20 and new FW V4.0 : performance increase for S7-1500 CPUs ≤ 1513
  - No new Article number (MLFB)!
  - Performance increase after FW update to V4.0

- One Performance – Level for all S7-1500 CPUs ≤ 1516
- Positioning via memory, interfaces, quantity structure …



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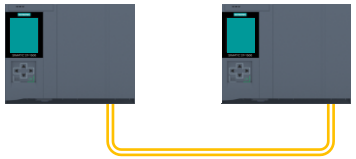
Redundant Controller S7-1500R/H

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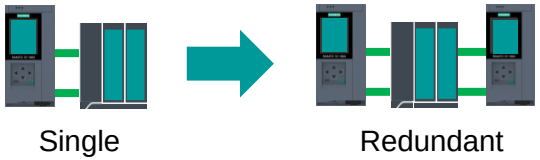
Redundant Controller S7-1500R/H
What's new with Firmware Version 4.0

Hardware Update for H-CPUs



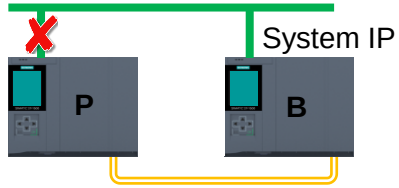
Increased Performance / More Memory / Additional Interface for CPU 1517H / Integrated Display

Scalable availability



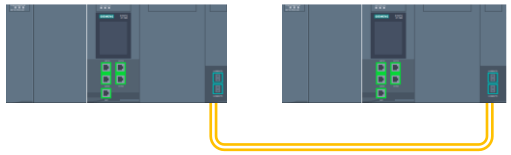
Single Mode for R-CPUs for easy upgrade from a Single- to a Redundant System

Avoid communication loss



Move System-IP address to Backup PLC in case of network interrupt to Primary Controller

Extended retentive data



Support of HF System Power Supply allows extension of retentive memory of R/H CPUs

Additional standard features



Missing features of standard CPUs can now also be used on R/H controller:

- Profiling
- Additional System Functions
- Extension of Web-API



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SIMATIC ET 200SP Open Controller 3

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The new SIMATIC ET 200SP Open Controller 3 (OC3) - the new features at a glance!

Higher Performance
for Windows/Industrial OS and Software Controller (F/T/TF)

USB 3.2 Interfaces
for faster transfer rates

Additional IE/PN-RT interface
can be assigned to OS or Software Controller (F/T/TF)



Bundles with WinCC Unified
together with Software Controller (F)

Wider temperature range
enables new areas of application: -30°C..60°C

SIMATIC Industrial Edge
together with Software Controller (F)

ET 200SP Open Controller 3 – Open for your applications!

Configurable with TIA Portal V20. Release planned for Q2/2025.

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SIMATIC ET 200SP Open Controller 3 (OC3)
Variants

With TIA V20
Planned Q2-2025

Open Controller 3 variants





Software Controller
CPU 1505SP
(V40.0)



General Purpose
Operating Systems



WinCC Unified

Bundle Version – Windows LTSC 2021
CPU 1515SP PC3
CPU 1515SP PC3 F
CPU 1515SP PC3 T
CPU 1515SP PC3 TF

Bundle Version – Windows LTSC 2021
CPU 1515SP PC3 + WinCC Unified PC RT
CPU 1515SP PC3 F + WinCC Unified PC RT

Bundle Version – Industrial OS V4.x
CPU 1515SP PC3 - IndOS
CPU 1515SP PC3 F - IndOS

Bundle Version - Industrial Edge
CPU 1515SP PC3 - IndEdge
CPU 1515SP PC3 F - IndEdge

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SIMATIC ET 200SP Open Controller 3 (OC3)
Comparison with OC2





new

	CPU 1515SP PC2 (OC2)	CPU 1515SP PC3 (OC3)
Processor	Intel Atom® E3940, 1,6 GHz, 4 Cores	Intel Atom® x6416RE, 1,7 GHz, 4 Cores
Mass storage	128 GB CFast Card (changeable)	128 GB SSD (changeable)
Working Memory	8 Gigabyte RAM	8 Gigabyte RAM
Graphic interface	1x DisplayPort DPP	1x DisplayPort DPP
USB interfaces	2x USB 3.0; 2x USB 2.0	3x USB 3.2 (type A)
PN-Interfaces for Software-Controller (RT/IRT)	1x SIMATIC BusAdapter; 2 Ports (RJ45, SCRJ, LC)	1x SIMATIC BusAdapter; 2 Ports (RJ45, SCRJ, LC, LD-LC*)
IE-Interfaces for OS	1x 1000 Mbps Ethernet interface	1x 2500 Mbps Ethernet interface
Interfaces configurable for OS or Software-Controller	-	1 x Ethernet-Interface RJ45 (Gbit for OS, PN-RT support for Software-Controller)
Central SP Bus for usage of ET 200SP I/O modules directly with Software-Controller	✓	✓
Pre-installed operating system	Windows 10 Enterprise IoT 2021 LTSC Industrial OS V3.x	Windows 10 Enterprise IoT 2021 LTSC Industrial OS V4.x Industrial Edge
Available S7-1500 Software-Controller (pre-installed)	Windows: Standard/F/T/TF; Industrial OS: Standard/F	Windows: Standard/F/T/TF; Industrial OS: Standard/F Industrial Edge: Standard/F
Ambient temperature during operation	-20°C … 55°C / 60°C with restrictions	-30 .. 60°C
Dimensions (w/h/d)	160/117/75	160/117/75

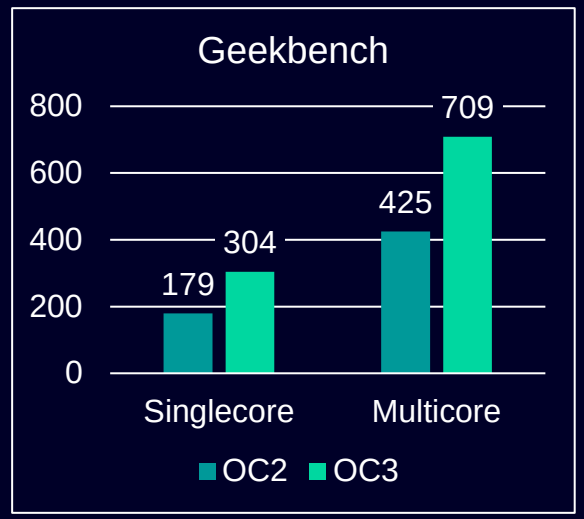
*LD-LC: Support via later firmware update

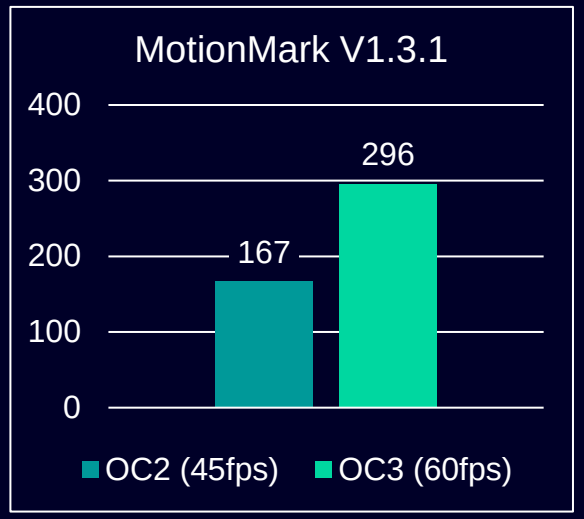
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SIMATIC ET 200SP Open Controller 3 (OC3)
performance and quantity structures



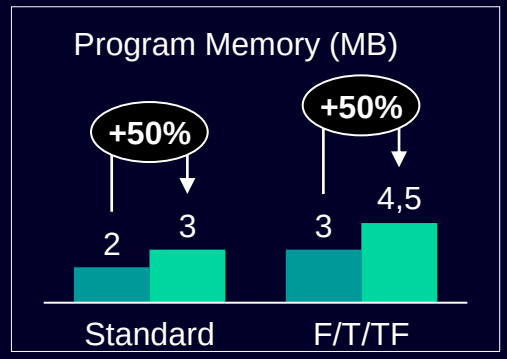
Benchmarks (executed under Microsoft Windows 10 IoT Enterprise LTSC 2021)

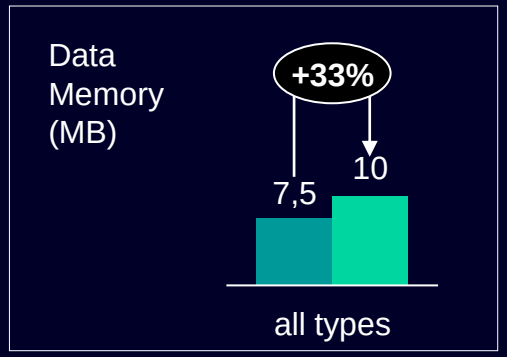




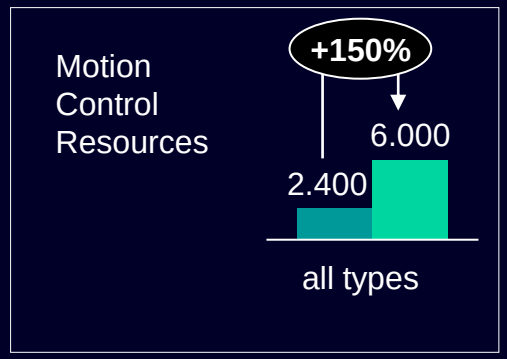
Test	Focus
Geekbench	generic Benchmark
MotionMark V1.3.1	measures a browser's capability to animate complex scenes at a target frame rate → WinCC Unified relevant
Note: At the time of creation (10/2024), no measured values were available for the Software Controller on OC3	

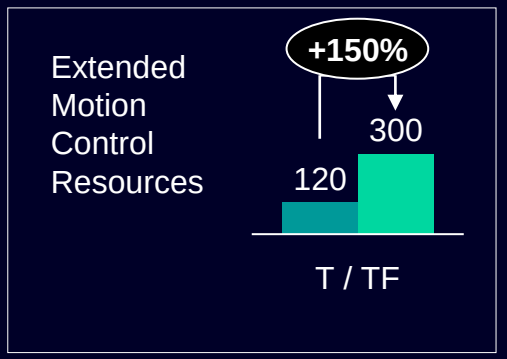
Quantity structures of the Software Controller (F/T/TF)





OC2 OC3



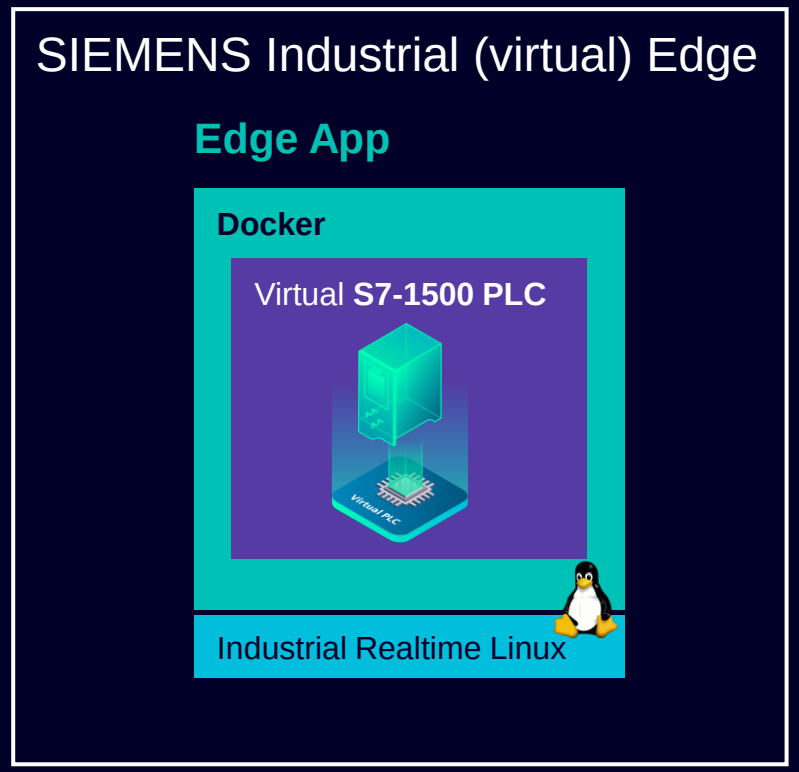


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SIMATIC S7-1500V

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SIMATIC S7-1500V
Virtual controller



Highlights TIA V20

- Release of Version 2.0
- Failsafe Support for vPLC
- AX - “IT Like” Engineering
- Improved communication
- Licensing

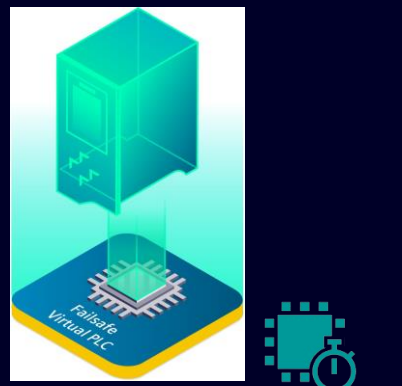
The basic idea … we bring **SIMATIC** on the Industrial Edge!

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SIMATIC S7-1500V F
Safety Virtual controller

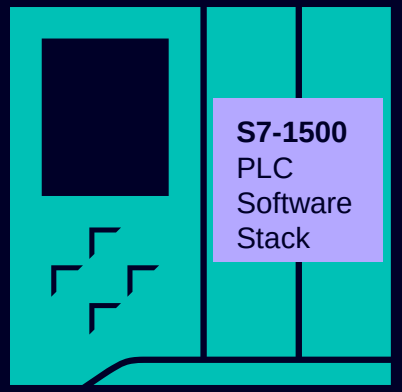
S7-1500V F

- **Virtual Failsafe SIMATIC S7-1500 PLC**
- Hardware independence
- TIA Portal compatible
- App Management over IT/Edge

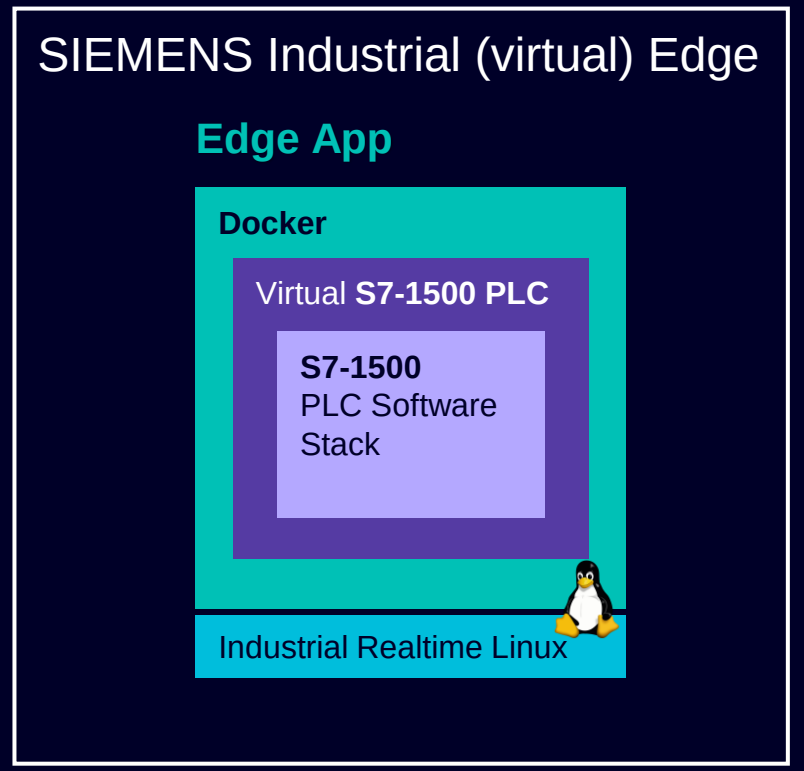


Time Service App

S7-1500 PLC



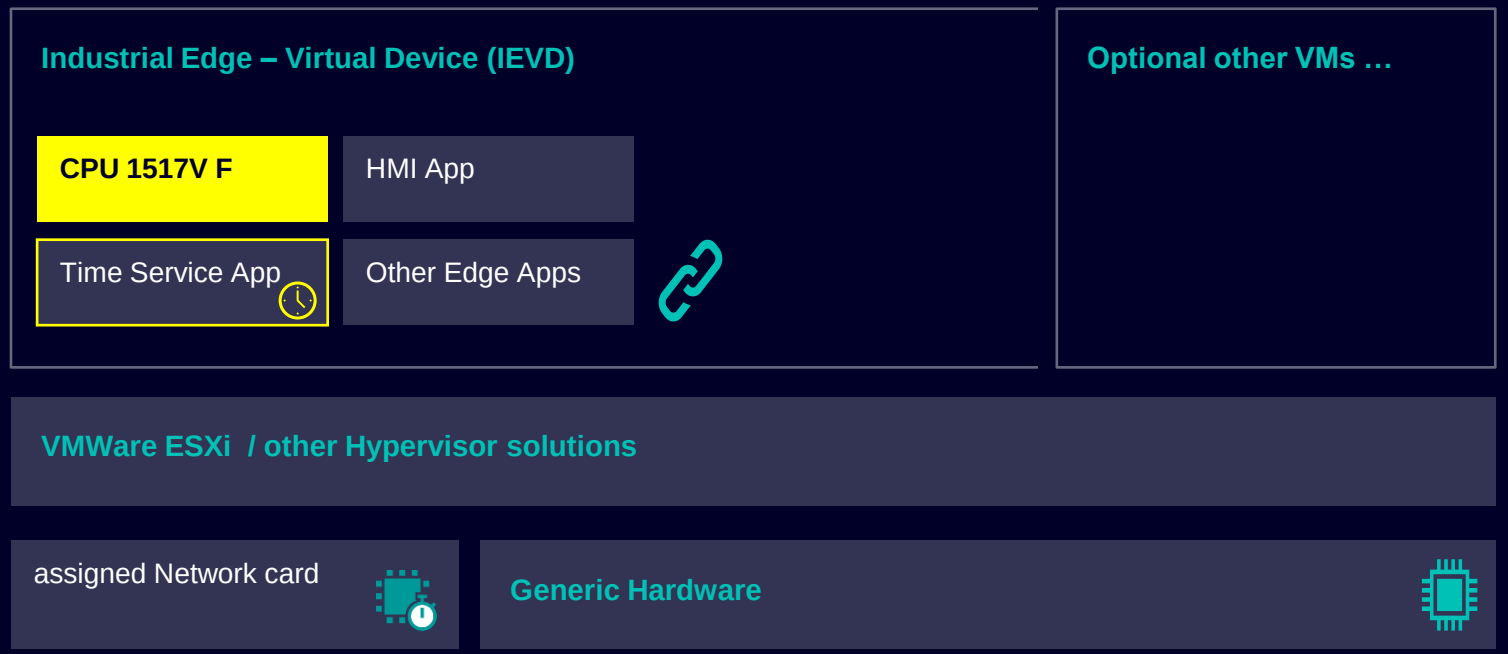
Virtual SIMATIC PLC



The basic idea … we bring **SIMATIC** on the Industrial Edge!

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SIMATIC S7-1500V
Big picture virtual Edge Device Failsafe



Failsafe requires Time redundancy

- 2nd independent Timer, distributed via Time Service App
- Utilizing PTP from Network Infrastructure
- Time Service-App is using at least one NIC / PN-Interface (For Maintenance more than one PN-Interface configurable)
- Time Service-App is providing the 2nd Timer to various F-vPLC

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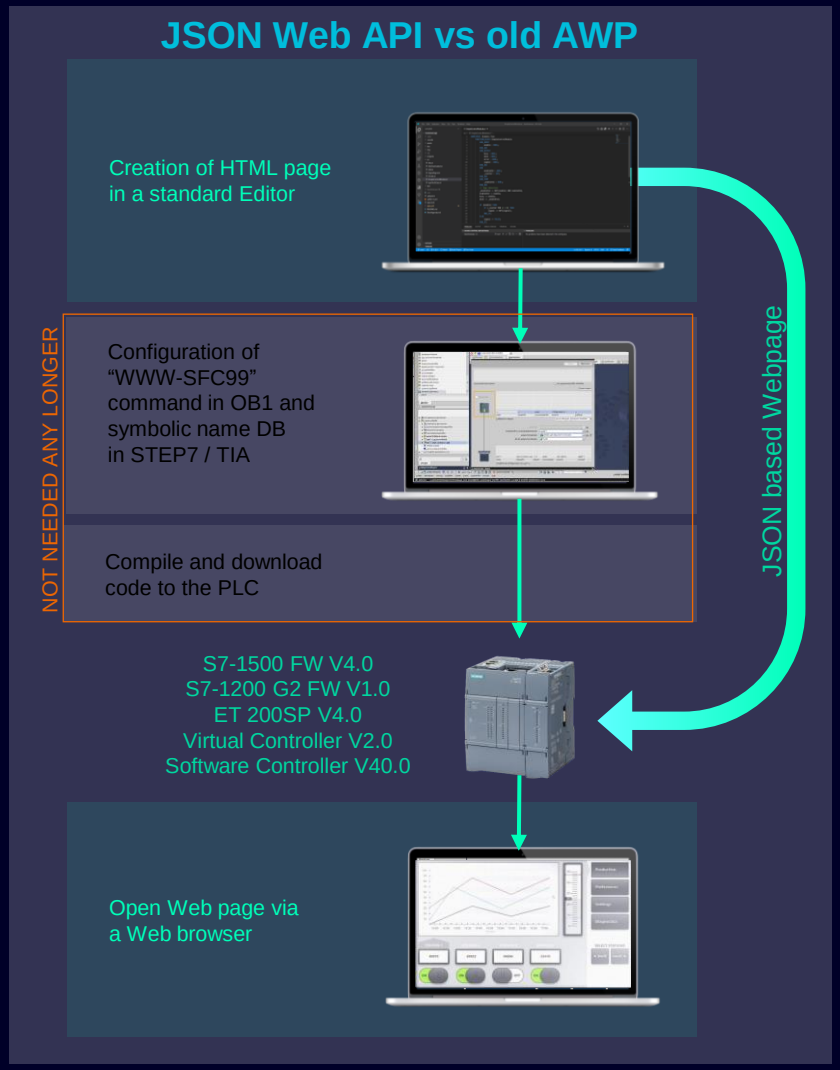
S7-Web Server

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S7-Web Server – Development of Custom Web Pages
New state of the art technology (JSON Web API) replace AWP

NEW



IMPROVEMENTS

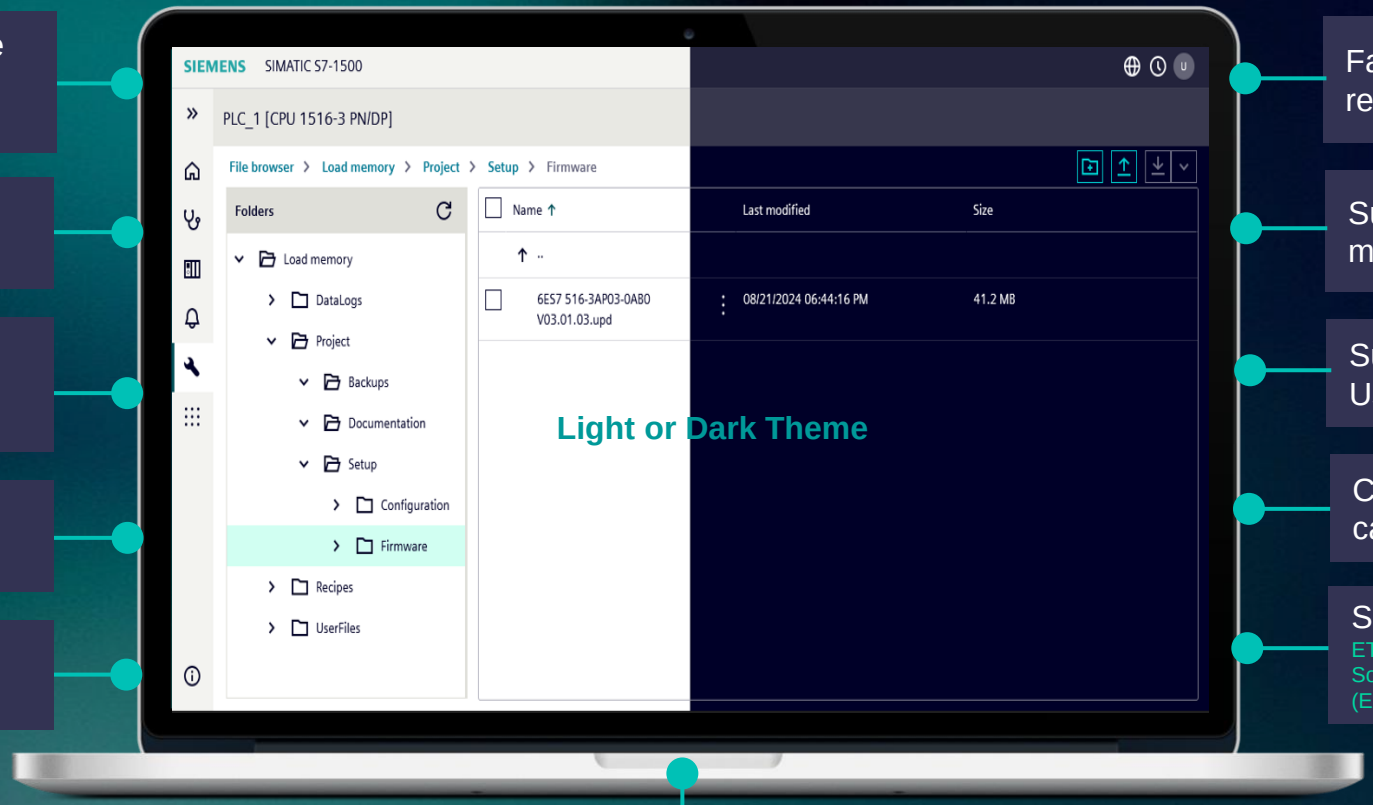
- ✓ **Fast & easy creation of Web Pages using JSON Web API**
- ✓ **Reduction of development complexity**
  - No longer use of "WWW" (SFC99) and System DBs for storage
  - No need to compile and download code to the PLC (STOP-RUN)
  - Complete independence from web development and PLC Logic
- ✓ **Web pages editing and testing without process interruption**
- ✓ **Access to more data types and parameters of the PLC than only process variables**
- ✓ **Higher S7-CPU performance due to lower memory consumption and communication load**
- ✓ **Faster Web browser response time due to improved caching**
- ✓ **Embed PLC Web Pages in an HTML Frames with new Trusted Client (e.g. in WinCC Unified Screens)**
- ✓ **Secure encrypted communication via "https://"**

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S7-Web Server – New Standard System Web Pages
Modern System Web Pages based on HTML5 / JSON Web API

NEW

- HTML5 File Browser and tree view for an easy navigation through folders
- User friendly alarms control and diagnostic buffer viewer
- Context sensitive options for download, rename, move, or delete files
- Status Information on every page (e.g. alarms)
- Easy access to Data Logs, User Files and Recipes



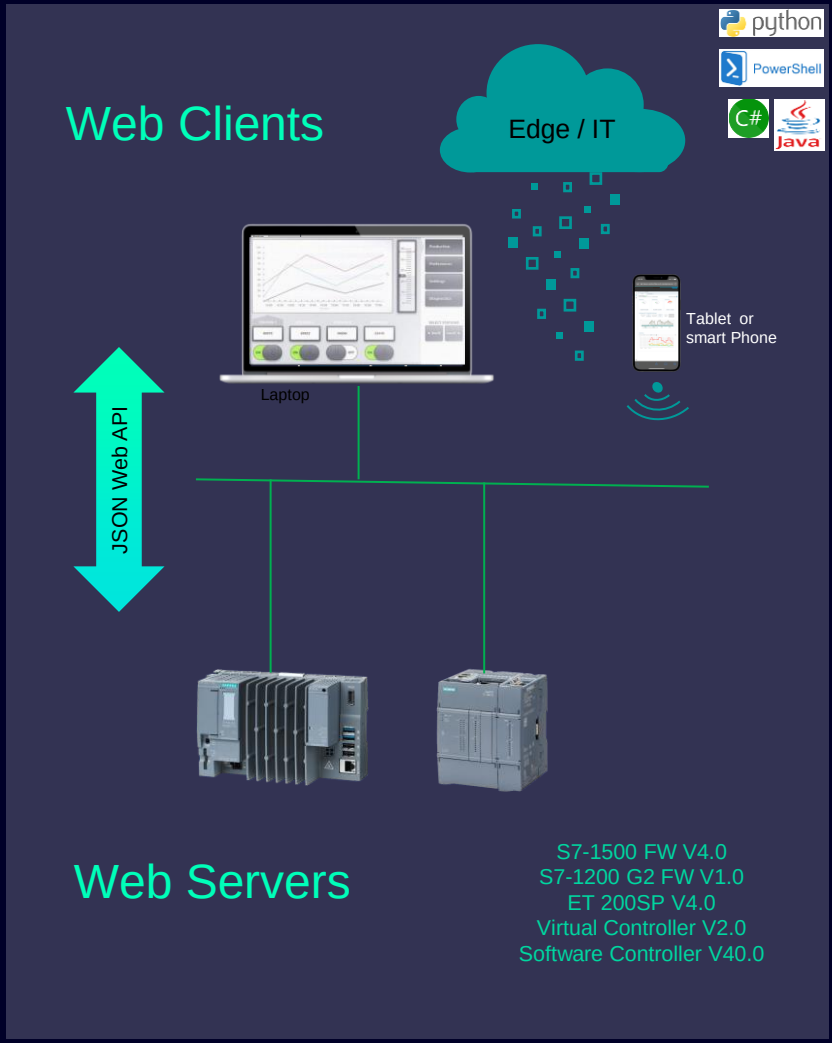
- Faster Web page loading and reduction in communication load
- Support of trusted client methods for Unified Panels
- Support of Local and Central User Management (UMC)
- Client-side password change capability
- Support for S7 Product Family:
  ET 200SP V4.0, Virtual Controller V2.0 Software Controller V40.0, S7-1500 FW V4.0 (Except R/H)

Interoperability with custom Web pages for consistent session handling, time, language, and theme definition

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S7-Web Server – Development of IT Applications using JSON Web API
Access to a wide range of OT information

NEW



OT / IT Link access via JSON-RPC Web API

Standard lightweight data-interchange format, easy to read and write, supported by many standard programming languages (Phyton, C++, JavaScript, HTML)

Access to a wide range of OT information

Access to the complete JSON Web API library on the S7-CPU

- User program (reading & writing of process data, profiling, data logs)
- Diagnostic information (alarms, diagnostic buffer, syslog)
- Monitoring of safety status, parameter and runtime groups
- Maintenance (File Management)

Web API

Commissioning Support via Scripts

Support of commissioning activities without need of using TIA

- Monitoring and change of operating mode
- Backup and restore

Secure OT / IT Communication

Support of security mechanisms like encrypted communication

- Trusted client configuration
- Password change

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Safety Integrated

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SIMATIC F-IOs

ET 200SP

- F-DI 8x24VDC HF
- New Firmware V3.0 – only with new FS
- Compatible successor
- New Feature 1x24V Counter SIL3
  - Standstill monitoring
  - Overspeed detection
  - Counting up and down
  - 500Hz counting frequence
  - 32bit signed value - +/- 2 000 000 000
  - High counting limit, low counting limit and start value are parameterizable
- Planned release: Q1/2025 with HSP for V20



- F-DQ 4x24VDC/2A PM HF
- New article number: 6ES7136-6DB01-0CA0
- Compatible successor
- Reduction of power consumption up to 50%
- Less self operation temperature
- New function LVV acc. EN 54
- Planned release: Q1/2025 with HSP for V20



ET 200MP

- F-AI 8x 0(4)..20mA HF
- New Firmware V2.0 – only with new FS
- New Feature:
  - HART communication support acc. Rev 5 up to 7 for HART field devices
  - Support MSI
- Planned release: Q3/2024 with HSP for V19



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ET 200ecoPN M12-L Fail-safe
F-DI 4x/F-DQ 2x/DIQ 4x/IO-Link Class B



4x F-DI channels, 2x F-DQ channels, 4x DIQ channel, 1x IO-Link Class B port

- Separate sensor supply for each F-DI channel, allows parallel use of electronic and electro mechanical sensors. Support of safety mats.
- Each F-DQ channels (2A) with additional Us: 1L+ and 1M as power power supply for ,e.g. ET 200AL. F-DQ channels operates as 2L+/2M for safety shutdown (SIL2) of ET 200AL outputs.
- 4x DIQ standard channels, that can be assigned individually as DI or DQ (0.5-2A)
- 1x IO-Link Class B port, incl. safety shutdown of 2L+/2M (2A) (SIL2) on pin 2 and 5 for , e.g., valve islands. Note: Pin 2 and 5, can be used as third F-DQ in SIL3/PLe quality as well.
- Embedded E-Stop and Enabling functions, assignable in HW configuration of TIA Portal.
- Market Entry Q1 2025 / TIA V20 HSP

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Fail-safe SIMATIC S7-1200 (G2): No more separate Safety license from V20 onwards
STEP 7 Safety Basic will be discontinued from V20 onwards

Until TIA Portal V19

Hardware:
S7-1200 F-CPU/F-DI/F-DQ

Software:
- STEP 7 V19 Basic (or Advanced)
- STEP 7 V19 Safety Basic

Starting with TIA Portal V20

Hardware:
S7-1200 (G2) F-CPU/F-DI/F-DQ

Software:
STEP 7 V20 Basic (or Advanced)



SIMATIC S7-1200



SIMATIC S7-1200 G2

Scalable automation solutions

Scalable portfolio for standard and machine safety functions.

Seamless system integration

Seamlessly integrated in STEP 7 without need for separate license.

Reduce license costs

- Reduce entry costs
- Especially customers requiring just few F-PLCs

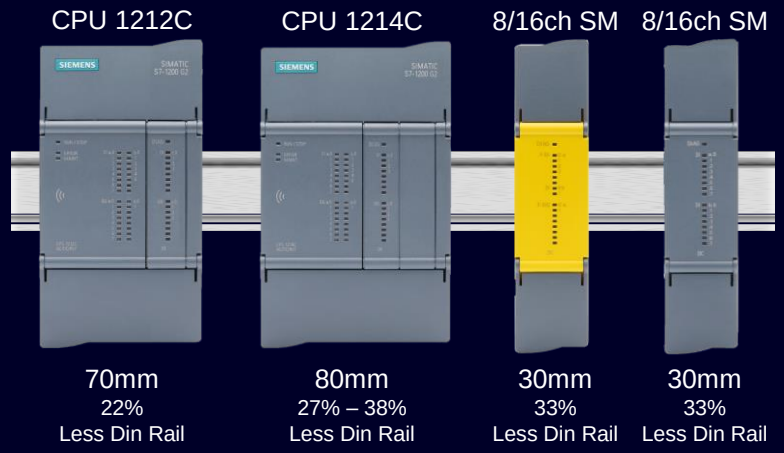
Hints

- V18/V19 Safety Basic licenses will still be available
- Future S7-1200 (G2) Hardware will use similar principles
- SUS contracts for Safety Basic will be discontinued end of 2024

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Overview
Higher competence

New HW design



Increased performance and seamless scalability

- Enhanced processing power, dedicated communication performance and more memory
- Up to 31 PROFINET devices and synchronized program execution with PROFINET IRT
- Near Field Communication (NFC) for commissioning and diagnostics support
- Optimized scalable hardware portfolio and seamless scalability across all SIMATIC controllers

Flexible Machine Safety

- Fail-safe integrated in the complete range (PROFIsafe communication, I/Os)
- Improved F-I/O portfolio (fail-safe signal boards, fail-safe signal modules with mixed I/Os)
- Fail-safe & Motion Engineering integrated in TIA Portal Basic

Efficient motion control

- Kinematics
- Multi Axis control
- Single Axis control



Expansion

	EM	RAM Data	RAM Program
CPU 1212C	6 in total therein 3 CM/CP	500 k	150 k
CPU 1212FC		500 k	200 k
CPU 1214C	10 in total therein 3 CM/CP	750 k	250 k
CPU 1214FC		750 k	300 k

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Overview
Fail-safe: signal boards and signal modules

SBs	SMs
4x F-DI(1oo1) / 2x F-DI(1oo2), 4-Vs*	8x F-DI(1oo1) / 4x F-DI(1oo2), 8-Vs*
2x F-DQ, PP-PM*	4x F-DQ, PP-PM*
2x F-DI(1oo1) / 1x F-DI (1oo2), 1x F-DQ. PP-PM*	4x F-DI(1oo1) / 2x F-DI (1oo2), 2x F-DQ. PP-PM, 2x DI

*Not within initial failsafe Portfolio release



1oo1 (One out of One):
1oo1 as simple redundancy, a single input connected to a fail-safe digital input

1oo2 (One out of Two):
Redundancy with cross-diagnosis: There are two independent sensors, each connected to an F-DI. Both sensors provide signals to the F-DI. The F-DI monitors the signals and makes decisions based on both inputs. This configuration is normally used in safety-critical applications

Vs: Integrated Sensor supply,
allows to detect short-circuit or overload scenarios, and react accordingly

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TIA Portal V20
System functions

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V new
- Limited Sales release in USA

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

TIA Portal Options

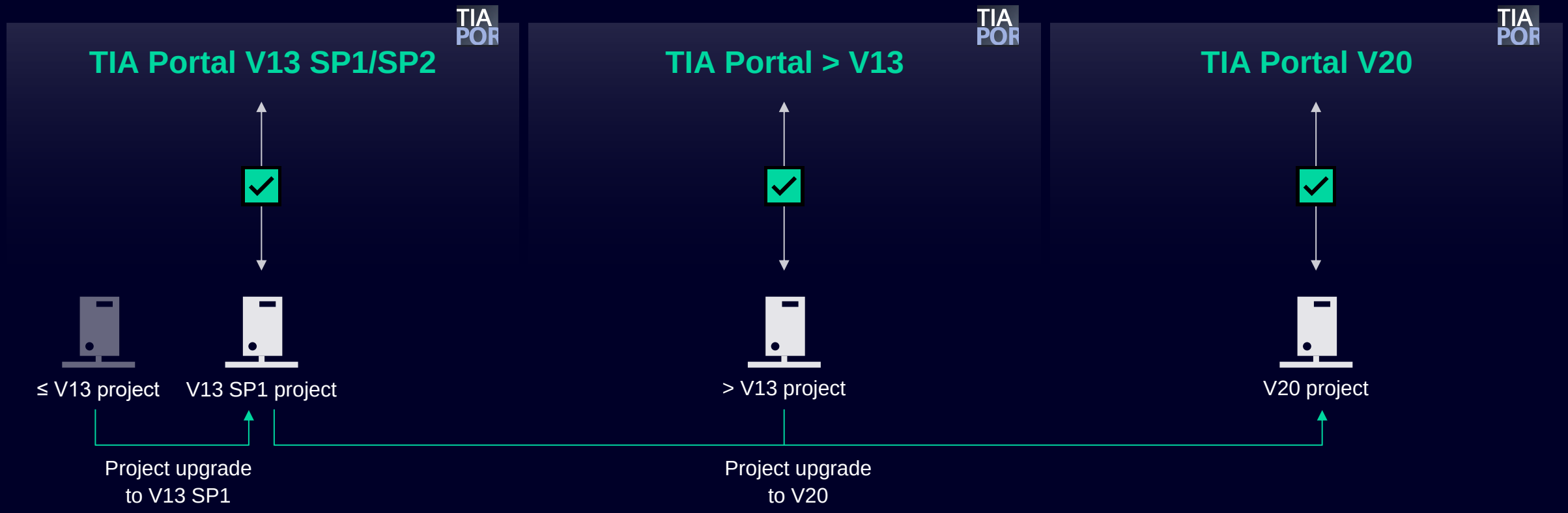
- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
- **SIMATIC Robot Library**
- **OPC UA**
- **SIMATIC S7-PLCSIM / S7-PLCSIM Advanced**
- **SIMATIC Target for Simulink**
- **TIA Portal Test Suite**
- **SIMATIC Visualization Architect (SiVArc)**
- **SIMATIC Modular Automation (MTP)** new
- **Central User Management (UMC)**
- **Modular Application Creator**
- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

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Upgrading TIA Portal projects

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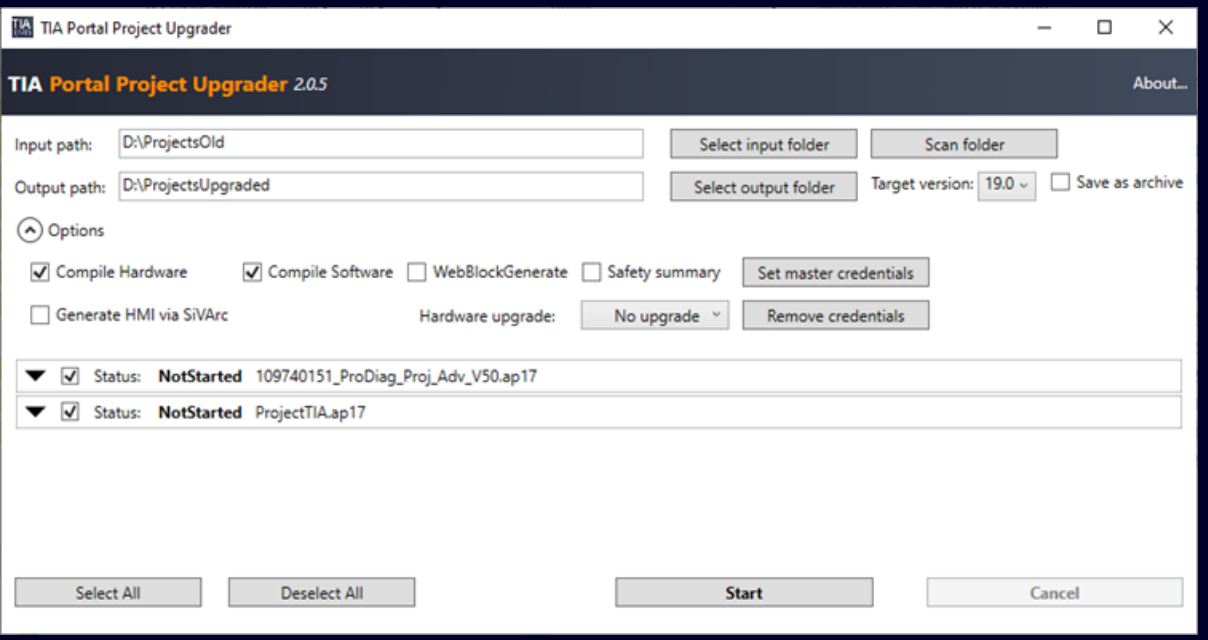
Upgrading TIA Portal projects



Side-by-side installation of **V13 SP1/SP2** up to **V20** allows access to all project versions.
The **V20** license can be used for all available versions from **V11**.

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Upgrading TIA Portal projects



TIA Portal Project Upgrader

based on TIA Portal Openness

- Upgrade multiple TIA Portal projects from previous versions (> V13) to the current TIA Portal version at once
- Fully automate the upgrade process
- Options to automatically upgrade hardware and firmware
- Options to automatically compile project and to start SiVArc generation after upgrade
- Generate Safety documentation (Safety printout)

Free download at SiePortal: 109811744

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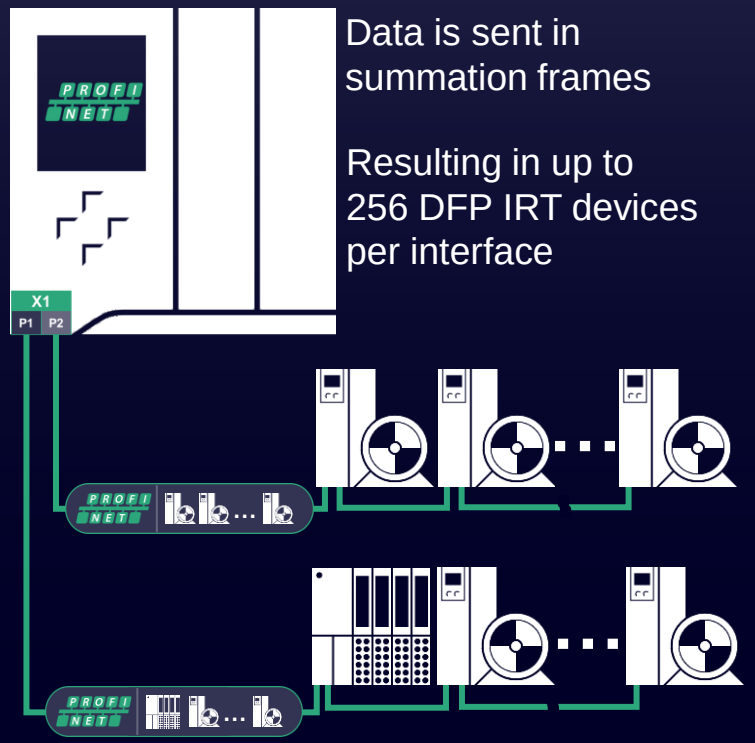
Enhanced PROFINET IRT features

(for advanced motion control)

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TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

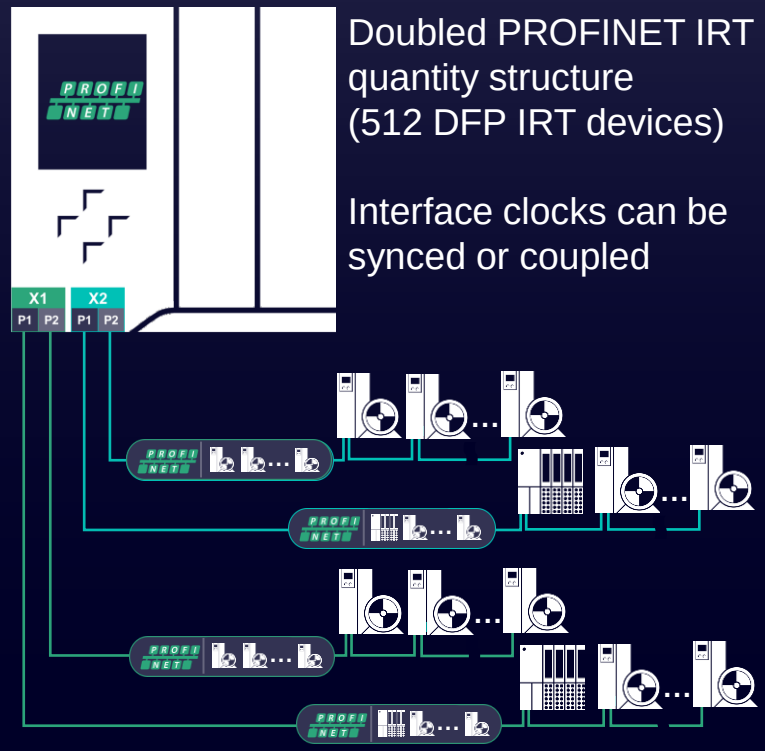
Increased amount of devices/axis with Dynamic Frame Packing (DFP)



Data is sent in summation frames

Resulting in up to 256 DFP IRT devices per interface

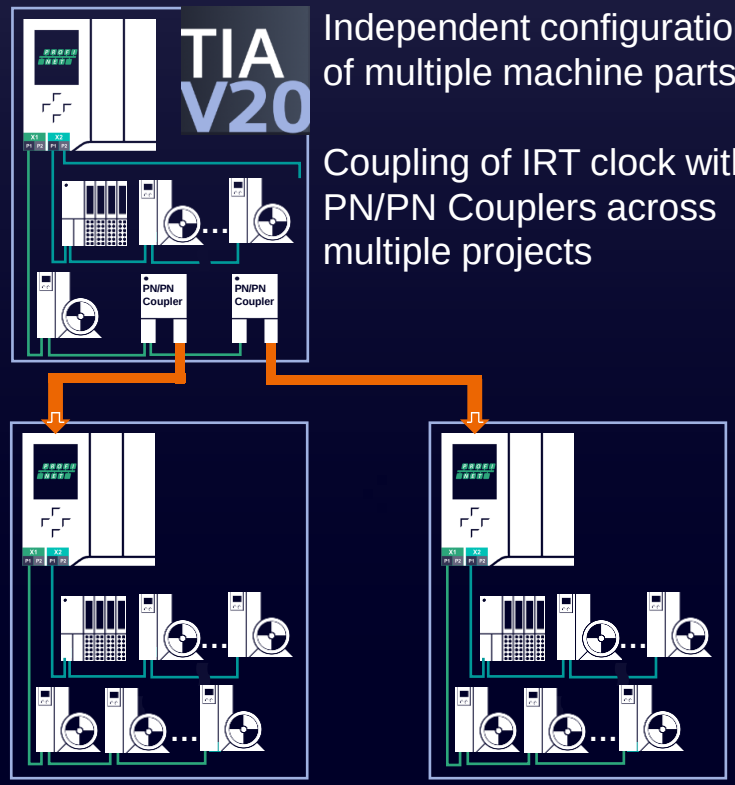
Even more devices/axis with secondary PROFINET IRT Interface



Doubled PROFINET IRT quantity structure (512 DFP IRT devices)

Interface clocks can be synced or coupled

Multi project motion applications to create modular machine units



Independent configuration of multiple machine parts

Coupling of IRT clock with PN/PN Couplers across multiple projects

These three features enable limitless quantity structures in PROFINET IRT

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*: *simplified illustrations*

TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

Increased amount of devices/axis with Dynamic Frame Packing (DFP)



Features

PROFINET Dynamic Frame Packing (DFP) can now also be used for high quantity structure applications with low cycle times

Benefits

The maximum amount of PROFINET IRT devices increases from 64 to 256 (per PN IRT interface)

Target markets

Machines with high performance motion tasks

Supported hardware

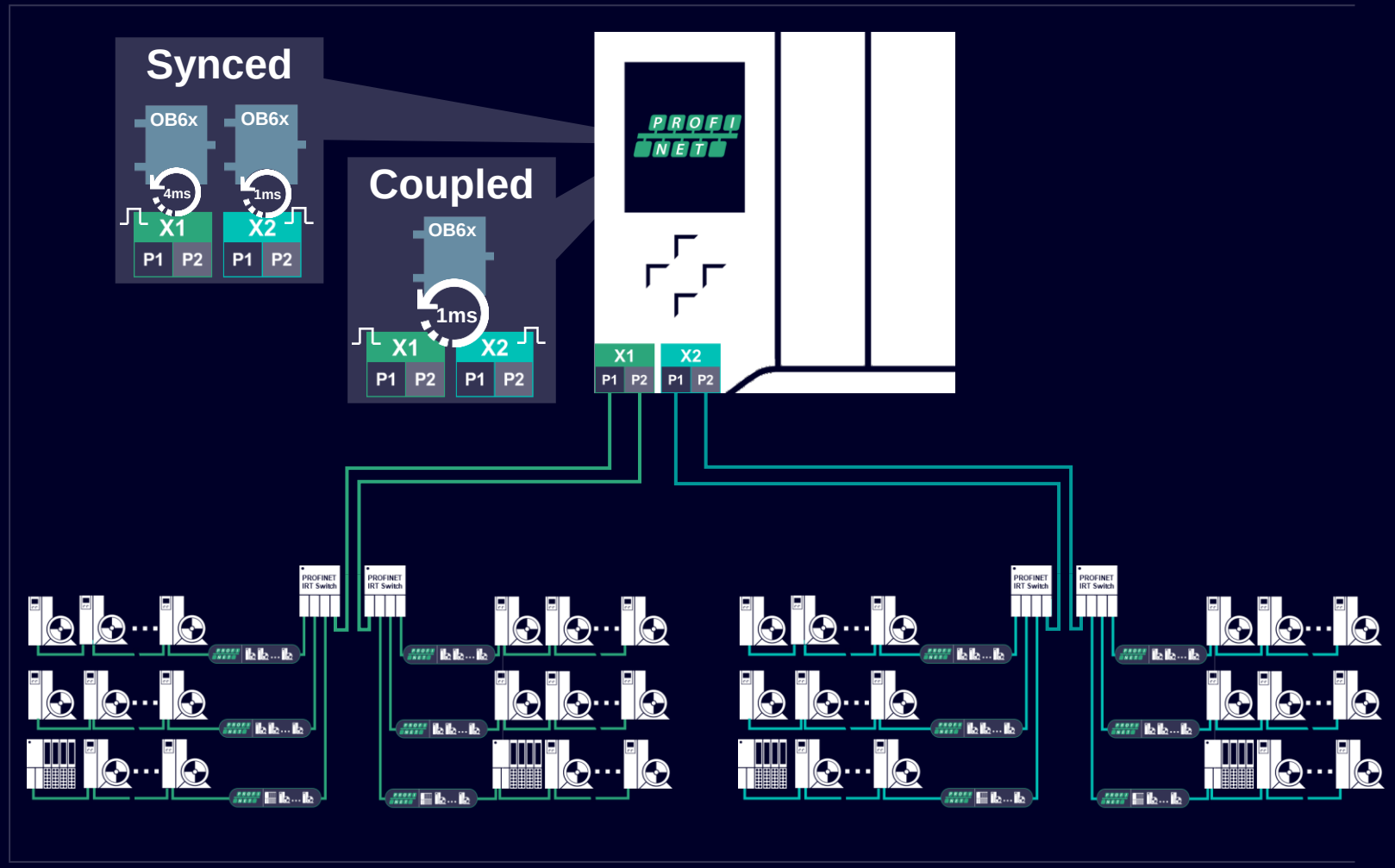
- SIMATIC S7-1500
  CPU 1517-3 PN, CPU 1518-3 PN,
  CPU 1517F-3 PN, CPU 1518F-3 PN
  CPU 1516T-3 PN, CPU 1517T-3 PN, CPU 1518T-3 PN
  CPU 1516TF-3 PN, CPU 1517TF-3 PN, CPU 1518TF-3 PN
  Software Controllers + CP 1625
- SIMATIC ET 200SP HS
- SINAMICS G220, S200, S210
- Several third-party PROFINET IRT devices

*: *simplified illustrations*

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TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

Even more devices/axis with secondary PROFINET IRT Interface



Features

A secondary PROFINET IRT Interface doubles the PLCs capabilities

Benefits

The maximum amount of PROFINET IRT devices increases from 64 to 128 (with only DFP device up to 512)

The PLC can operate two PROFINET IRT systems with synchronized or coupled bus cycles

Target markets

- Machines with high performance motion tasks
- Machines which require multiple bus cycles (e.g. out of efficiency or device capability reasons)

Supported controllers

- SIMATIC S7-1500

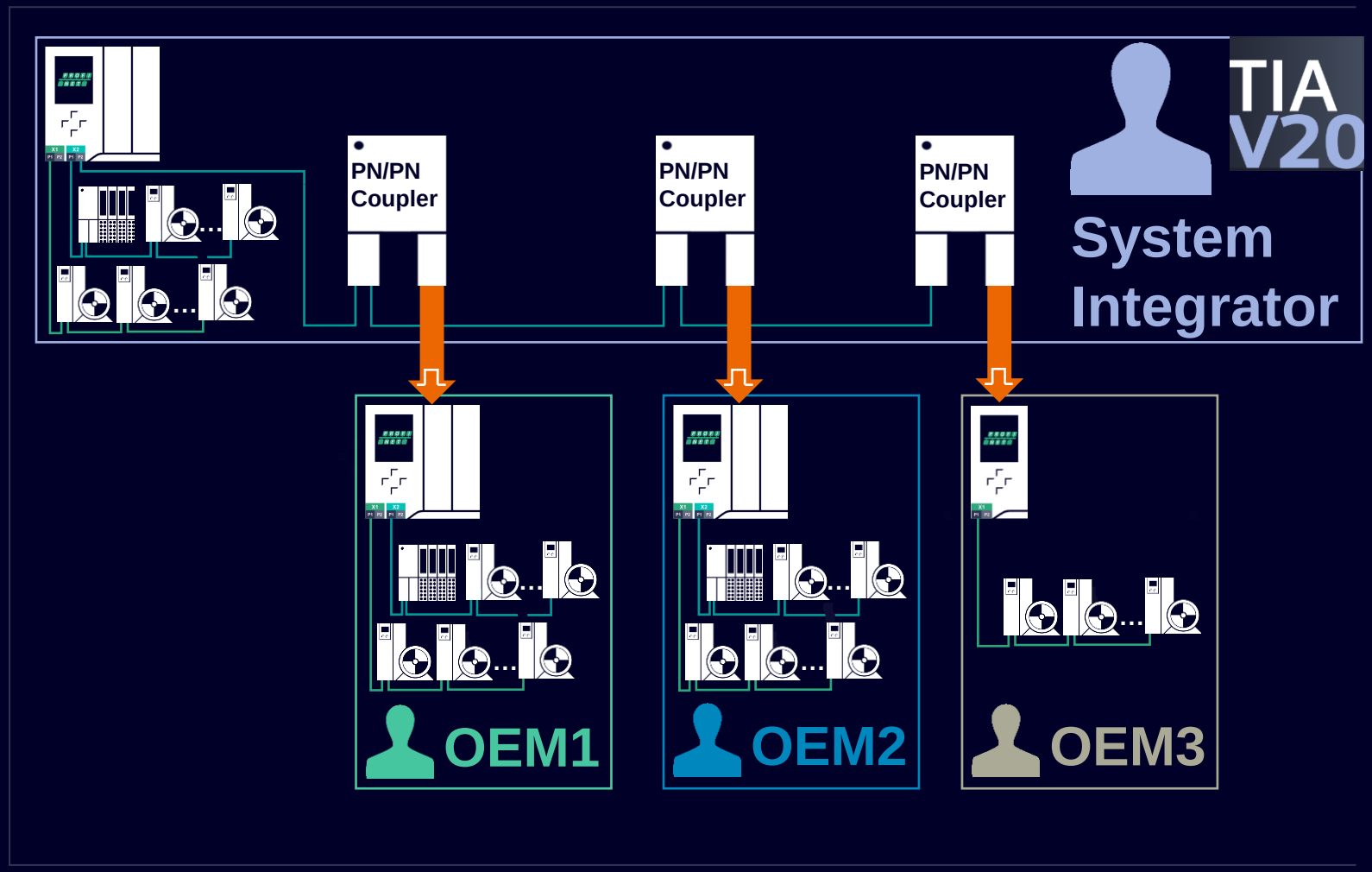
  CPU 1517-3 PN, CPU 1518-3 PN,
  CPU 1517F-3 PN, CPU 1518F-3 PN
  CPU 1516T-3 PN, CPU 1517T-3 PN, CPU 1518T-3 PN
  CPU 1516TF-3 PN, CPU 1517TF-3 PN, CPU 1518TF-3 PN
  Software Controllers + CP 1625-2

*: *simplified illustrations*

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TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

Multi project motion applications to create modular machine units



Features

Clock synchronization across multiple TIA Portal projects by use of PN/PN Couplers

Benefits

Independently engineer machine units by multiple OEMs

Increase quantity structure with multi controller applications

Target markets

- Machines with high performance motion tasks
- Machines with independently engineered units

Supported hardware

- **System Integrator:**
  PN/PN Coupler with FW V6.0 and TIA V20
  (6ES7 158-3AD10-0XA0)
- **OEM:**
  Any PN IRT Controller with any TIA Portal version

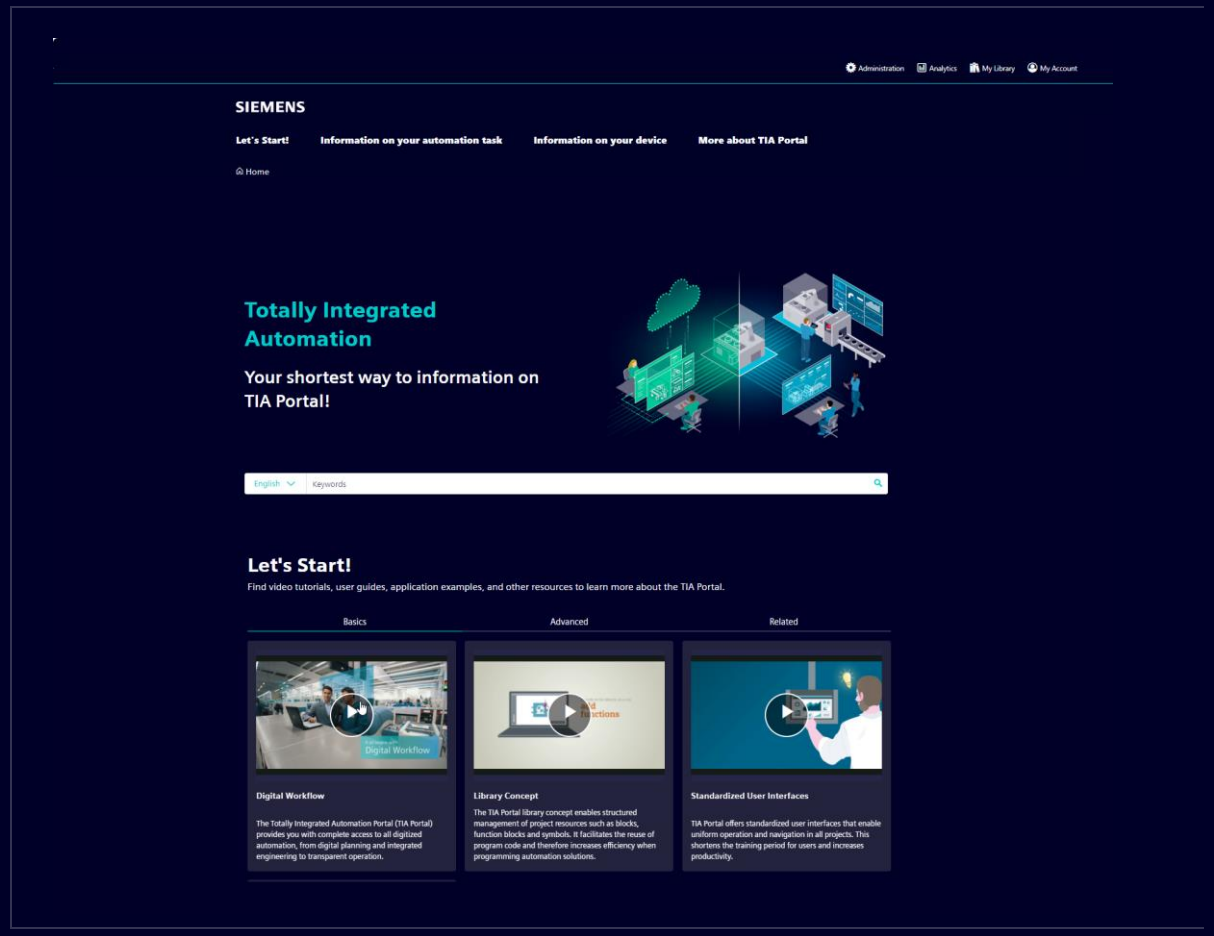
*: *simplified illustrations*

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TIA Portal Documentation

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TIA Portal Documentation (Online view)



Everything you want to know about V20 - and more!

The web-hosted TIA Documentation Portal provides central access to information on Totally Integrated Automation:

- Software documentation
- Hardware documentation
- Additional video tutorials, user guides, application examples, and other resources to learn more about the TIA Portal.

Easy to find – Easy to use

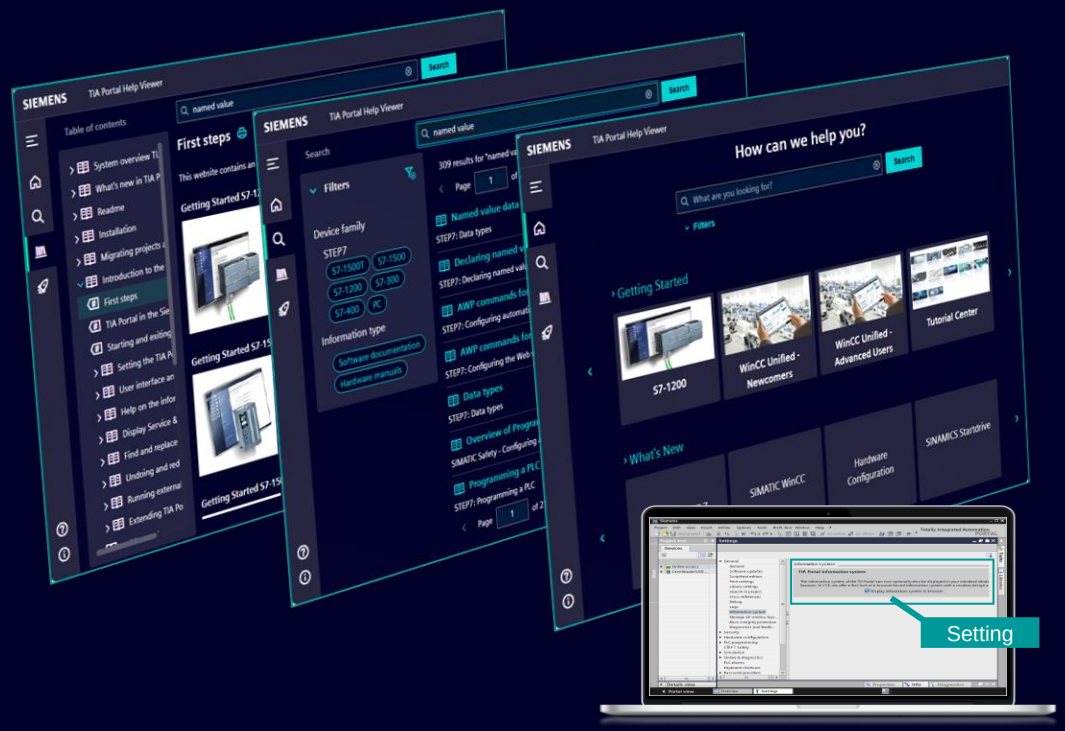
- Accessible without TIA Portal installation on your PC.
- High-performance search allows you to find topics in just a few moments.
- Content can easily be shared using URLs

Start the TIA documentation portal here - and remember to set a bookmark in your browser:

docs.tia.siemens.cloud

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TIA Portal Documentation (Offline view)



TIA Portal information system

Users who want to work offline with the locally installed TIA Portal information system, can continue to do so.

They will benefit from an innovated design of the offline information system

Modern design and improved navigation

The web view offers modern functionality, such as:

- Modern web design
- Modern search function and filters
- Bookmarks and tab handling in the web browser

Switch between web view and legacy view

Switch between the new offline view and the legacy offline view with the setting:

"Tools > Settings > General > Information System"

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TIA Portal Openness

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TIA Portal Openness is our API for automating your engineering workflows

SiePortal: 109792902

Highlighted API innovations in TIA Portal Openness V20:

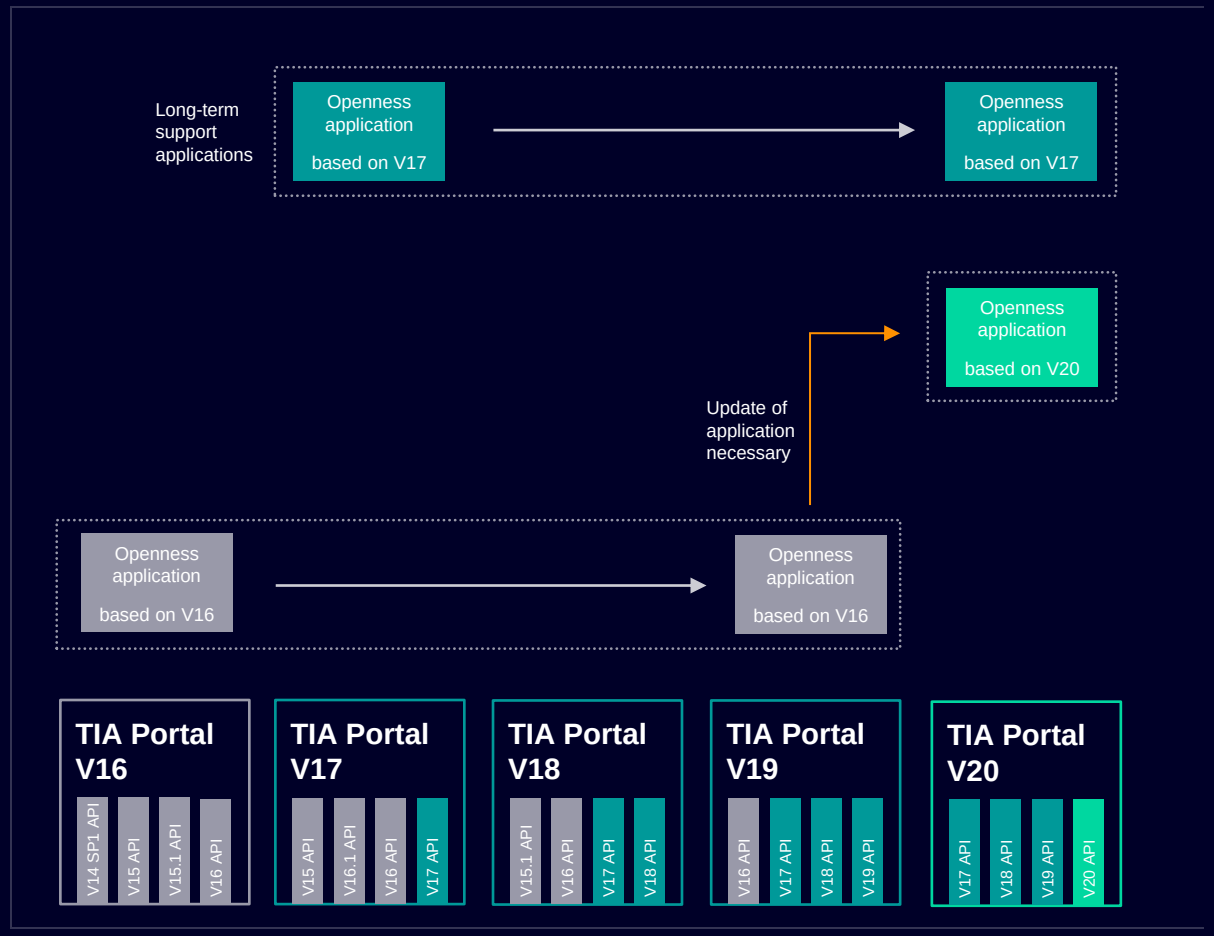
- Long-term support and compatibility
- APIs for Continuous Integration support such as new document-based formats for import/export, library type management/creation, Multiuser workflows and Continuous Testing (option package Test Suite Advanced)
- Extended access to hardware configuration and module parameters
- Innovations in additional option packages:
  SiVArc, SINAMICS Startdrive, SINAMICS DCC and WinCC Unified

For a list of all new features, refer to the TIA Portal Openness system manual, chapter “What’s new”.



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TIA Portal Openness
Long-term support and compatibility



Long-term support (LTS)
- Existing Openness applications since V17 will continue working.
- TIA Portal V20 delivers the LTS APIs for V17, V18 and V19.

New API version
- TIA Portal V20 delivers the new API version V20 to use the latest Openness features.

Discontinuation of oldest API version
- TIA Portal V20 no longer delivers the oldest API version V16.
- An update of applications using this version is necessary.

SimaticML file format compatibility
- New stable ordering of multilingual texts in SimaticML for comparing/versioning use-cases.
- Each API version in TIA Portal V20 creates SimaticML files of engineering version V20.
- Each API version in TIA Portal V20 supports importing SimaticML files from engineering versions V17, V18, V19 and V20.

.NET SDK version
- TIA Portal and TIA Portal Openness rely on .NET Framework 4.8 as a mature software framework as part of the operating system to build long-running enterprise-grade industrial-suited applications complying the needed long-term support.

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TIA Portal Openness
New general features

```
Device stationDevice = project.Devices.Find("S7-1500R/H system_1");

// Find all PLCs of a nesting level by classification (CPU)
IList<DeviceItem> plcs = stationDevice.DeviceItems.Find(DeviceItemClassifications.CPU);

// Find second PLC by name (Rail_1, PLC_2)
DeviceItem plcByName = stationDevice.Items.Find("Rail_1").Items.Find("PLC_2");

// Find first PLC by position number (Rack 0, Slot 1)
DeviceItem plcByPosition = stationDevice.Items.Find(0).Items.Find(1);
```

```
// Get name and value of all attributes with Read & Write access:
IReadOnlyList<KeyValuePair<string, object>> attributes =
   plc.GetAttributes(AttributeAccessOptions.ReadWrite);
```

```
// Get the identifier of an object:
PlcBlock currentPlcBlock = ...;
ObjectIdentifierProvider objectIdentifier = project.GetService<ObjectIdentifierProvider>();
string identifier = objectIdentifier.GetIdentifier(currentPlcBlock);

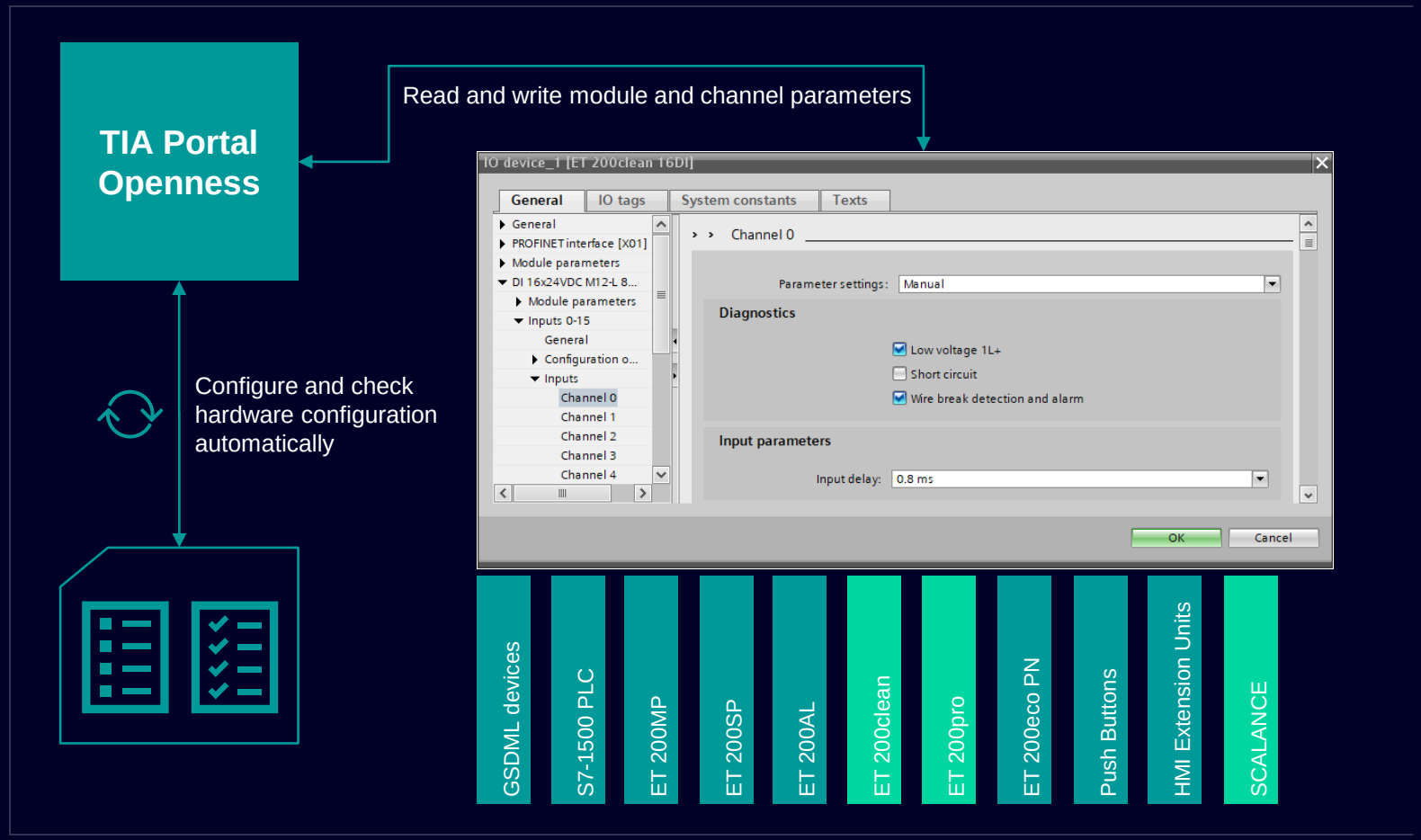
// Find the same object later again:
string identifier = "w1WdYM/ppEi6iPW1sFJmHQ==";
ObjectIdentifierProvider objectIdentifier = project.GetService<ObjectIdentifierProvider>();
PlcBlock foundPlcBlock = objectIdentifier.Find(identifier) as PlcBlock;
```

General

- Find device items faster by classification, name or position number
  - Multiple ways for different use-cases for fast navigation through the hardware
- Get all attributes of any object faster by access option
  - No need to first call GetAttributeInfos() and/or to iterate through individual attributes
- Unique object identifiers for objects in a project
  - Supported by these classes: Device, DeviceItem, PlcUnit, PlcSafetyUnit, PlcBlock, PlcType, TechnologicalInstanceDB, PlcTagTable, PlcTag, PlcUserConstant, PlcSystemConstant
  - The unique identifier is stable within the same project
  - No need to recursively scan the full project tree twice
  - Use the unique identifier to find the same object again when reopening a project at a later point of time
  - Use the unique identifier to hand over and find objects across process boundaries, e.g. between Openness applications and Add-Ins

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TIA Portal Openness
Extended access to hardware devices



Additional parameters support

Read and write hardware parameters* for additional module families for automated hardware configuration or checks:

- ET 200pro TM
- ET 200clean
- SCALANCE XC-200 (>= V.4.2), XP-200 (>= V4.3), SC-600 (>= V2.3), S615 (>= V7.1), XM-400 (>= V6.2)

Parameters* support for the following module families is already provided with previous TIA Portal versions:

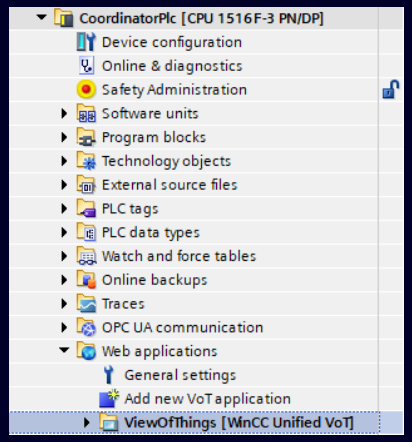
- GSDML devices (generic approach for all)
- S7-1500 PLC (Standard + Safety)
- ET 200MP (Standard + Safety, except communication modules)
- ET 200SP (Standard + Safety)
- ET 200AL (Standard + Safety)
- ET 200pro (Standard + Safety)
- ET 200eco PN (Standard + Safety)
- Push Buttons
- HMI Extension Units (Standard)
- SCALANCE XC-200 / XP-200 (≥ V4.3), SC-600 (≥ V2.3)

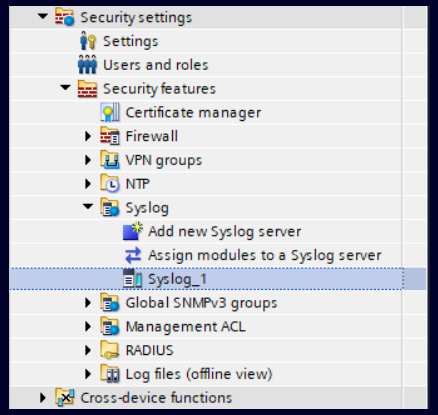
Existing New/Extended in V20

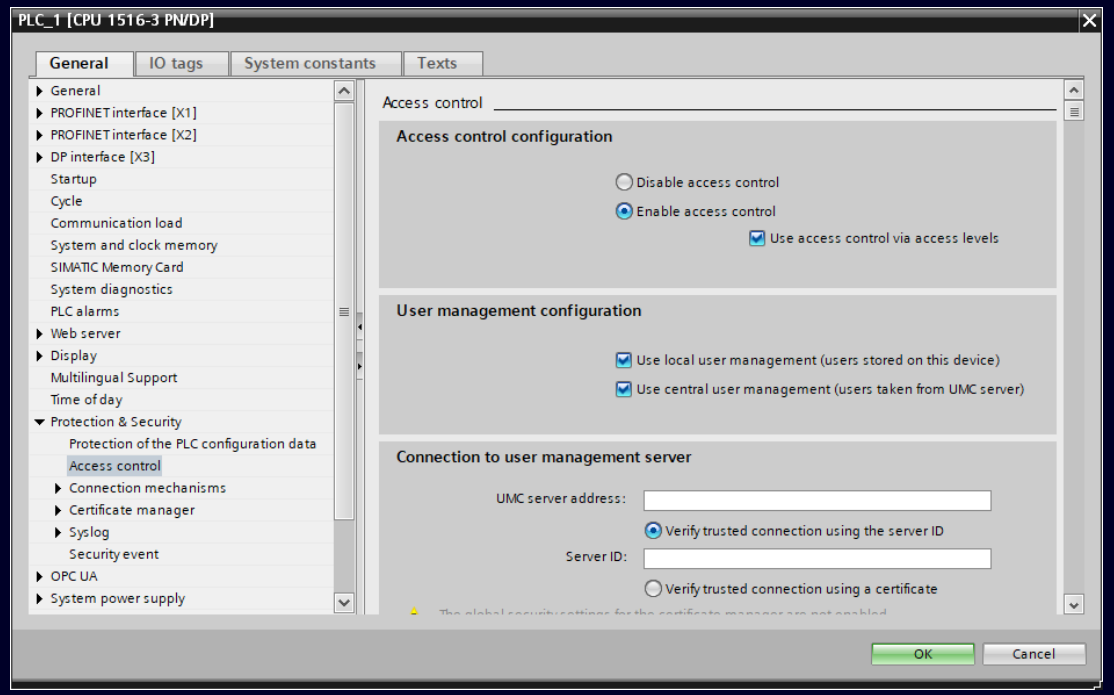
The detailed list of supported modules, channels and parameters is part of the system manual (appendix**) and next to the API: C:\Program Files\Siemens\Automation\Portal V20\PublicAPI\V20\HW Parameter description*

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TIA Portal Openness
Extended access to hardware configuration & networks and security settings







PLC configuration

- New PLC access control configuration for central user management (UMAC)
- New PLC account locking at runtime (UMAC)
- New system web pages configuration for web server
- New advanced multilingual support configuration for project texts being downloaded to PLC
- Download View of Things (VoT) applications to PLC

Module configuration

- Uniformed port label without whitespace
- Read PROFINET (sub)slot number attribute of modules
- MRP ring configuration for SCALANCE
- Import/export Telecontrol configuration (CP IRC / TIM IRC)

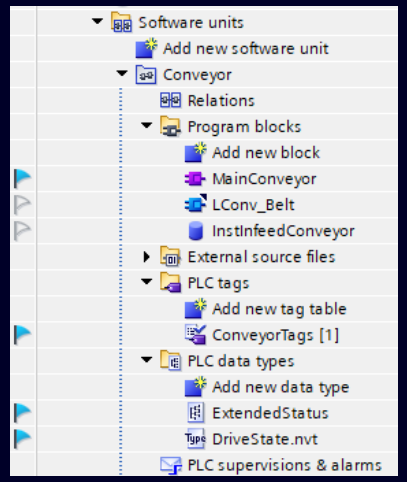
Security & UMAC

- New syslog server configuration on project level
- Create and manage device function rights, UMC users and user groups

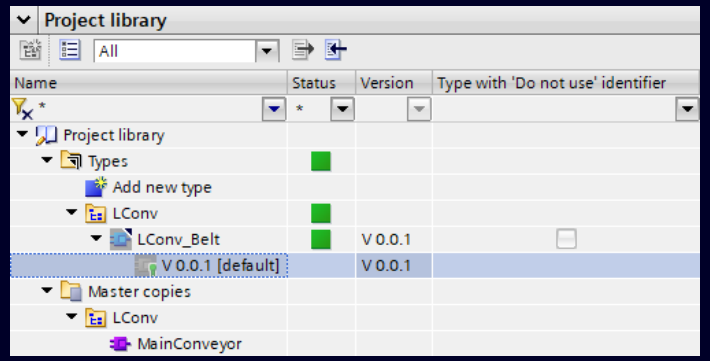
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TIA Portal Openness
New APIs for PLC user program generation and Continuous Integration support

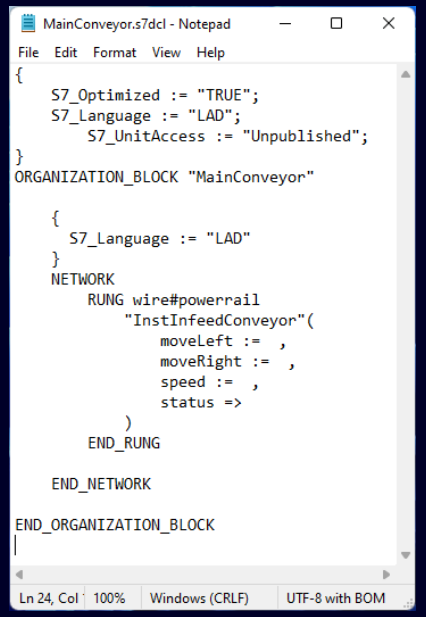
PLC user program and Multiuser features



Project library and Global library features



New SIMATIC documents format



TIA Portal libraries

- Get all information from libraries, types and versions
- Create new library types and versions from files
- Export library type versions as files
- Set into edit mode, release and discard library type versions
- Handle conflicts when inserting library type versions or master copies into project

PLC user programs

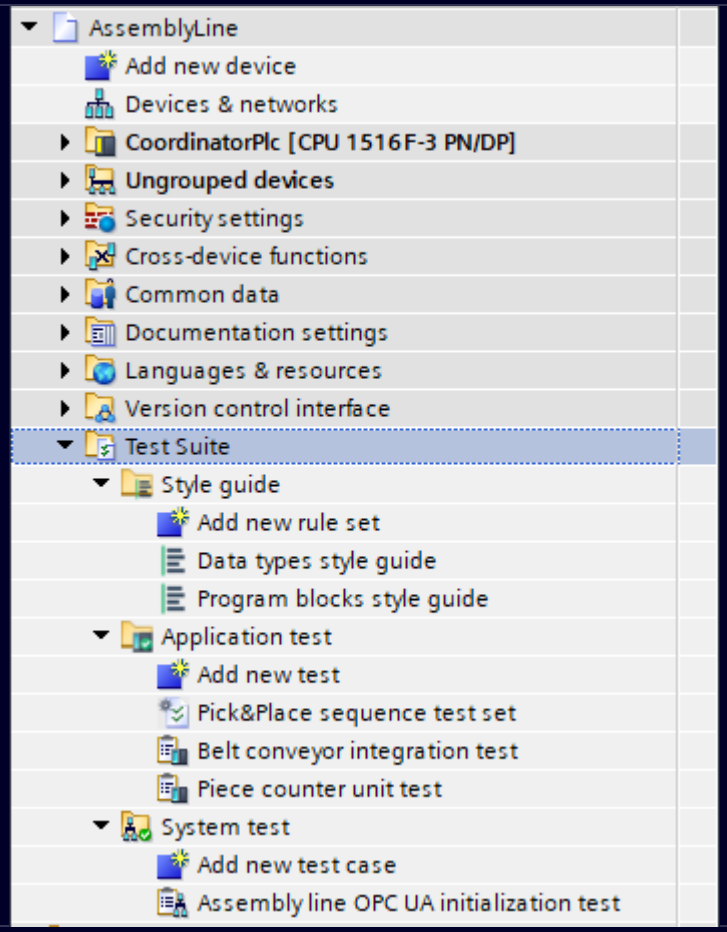
- New text-based file exchange format for PLC blocks for programming language LAD and Safety-LAD:
  Easy external text-based editing and comparison
- Browse PLC documents (e.g. named value types)
- Export and import PLC blocks, technology objects, PLC types and PLC documents in new SIMATIC documents
- Rename PLC tags and PLC tag tables
- Read checksums of PLC software and text lists

Multiuser engineering

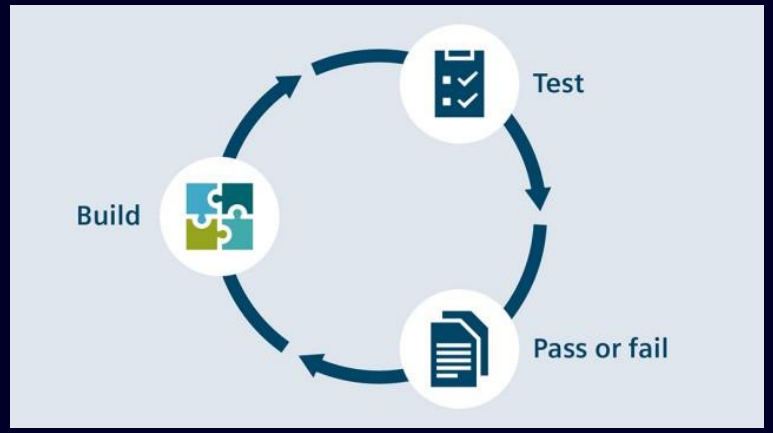
- Mark and unmark objects via marking service
- Access groups for server projects on TIA Project-Server

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TIA Portal Openness
New API features in additional option packages: **Test Suite Advanced**



Automated Build and Test via TIA Portal Openness



Test Suite Advanced

Programming style checks, application tests and system tests can be automatically created, configured, and executed periodically and reports created for Standard PLCs and Safety PLCs via TIA Portal Openness.

For automated project verification

- Extended TIA Portal Openness support for configuration of system test cases.
- New application test sets configuration and execution.

Continuous Testing & Integration

Rapid program changes require Continuous Testing. This is one essential part of Continuous Integration.

Benefits of Continuous Testing and Continuous Integration:

- Accelerate the development process
- Lower risk of faults
- Increase transparency of processes
- Save time through automated processes

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TIA Portal Openness
New API features in additional option packages

WinCC Unified

TIA Portal Openness innovations:
- Configure further dynamizations, expressions for dynamizations
- Configure further HMI runtime settings
- Support DB name multiplexing on HMI tags
- Support central color palette
- Import/Export of text lists (without formatted text)

SINAMICS Startdrive / DCC

TIA Portal Openness innovations:
- Activate/Deactivate “functions in use” for 3rd generation drives (EPOS / PID)
- Read all parameters on drives
- Get telegram size in bytes
- Get drive object number
- Support Edge telegram

SIMATIC Visualization Architect

TIA Portal Openness innovations:
- Advanced tags rules
- SiVArc expression resolver

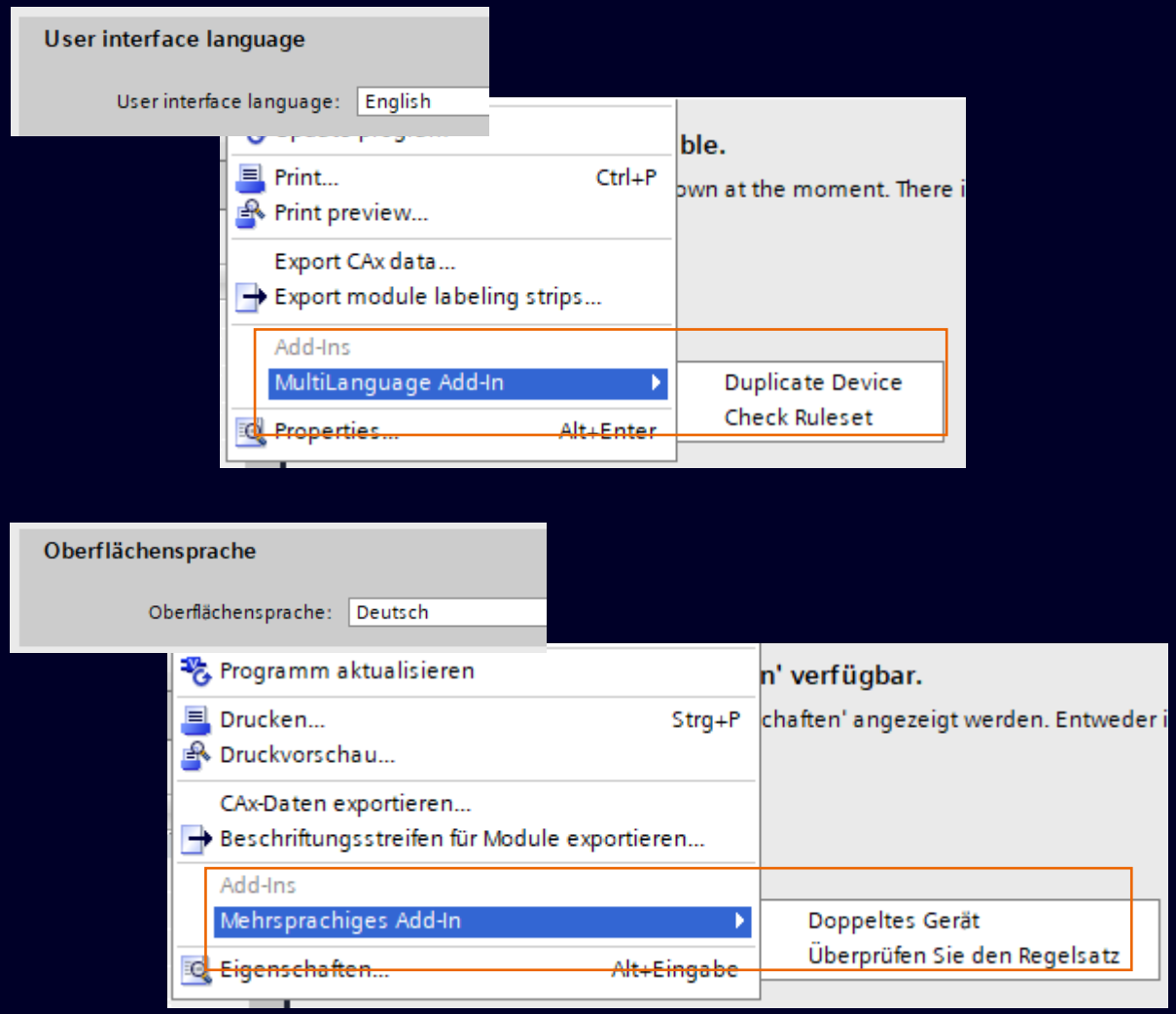
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TIA Portal Add-Ins

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TIA Portal Add-Ins
Language-aware Add-Ins



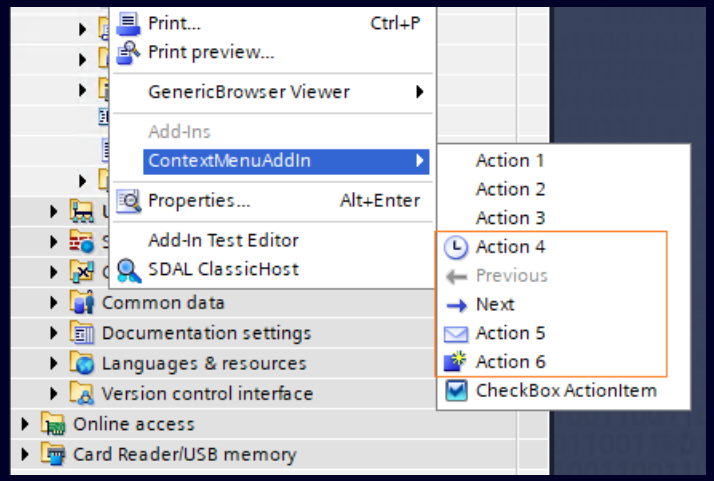
TIA Portal User interface language-aware Add-Ins

- Add-In authors can create multilingual Add-Ins which follow the TIA Portal User interface language.
- Multilanguage texts can be provided for a context menu entry of an Add-In, Add-In UI and for feedback messages logged from Add-In to TIA Portal output view.
- If the TIA Portal language is changed after activation of the Add-In, then the Add-In needs to be reactivated to adapt to this new language.

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TIA Portal Add-Ins
Icon support for Add-Ins



Icon support for context menu Add-Ins

- Add-In authors can show their own custom icons for context menu entries of Add-Ins.
- Icons can be shown for all kinds of context menu entries except checkbox and radio button style context menus.
- This enables users with clear and faster recognition of menu entries. It enhances the user experience of Add-Ins, aligning it with TIA Portal UI standards.

Performance Improvement in Add-Ins

- Improved performance of context menu Add-In display, no display timeout issues.
- Add-Ins are stateful from V20 onwards.

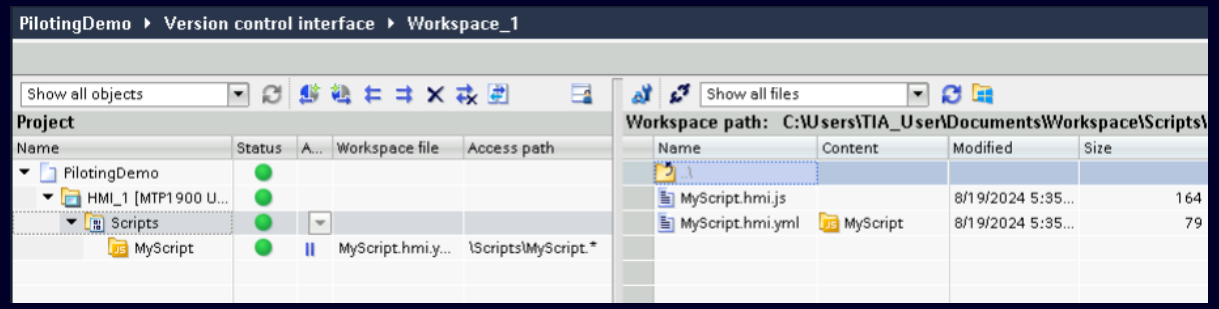
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Version Control Interface (VCI)

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Version Control Interface (VCI)
HMI Global Script Modules available in VCI



Export/Import of HMI Global Script Modules through VCI

- Possible to export and import HMI Global Script Modules using VCI.
- User can now export/import JavaScript files via VCI, thus allowing better mergeability and easy exchange with source control.
- HMI Global Script Modules exports as multiple documents, thus allowing clear segregation of master module file and individual JavaScript files.
- User can source control HMI Global Script Modules through VCI.

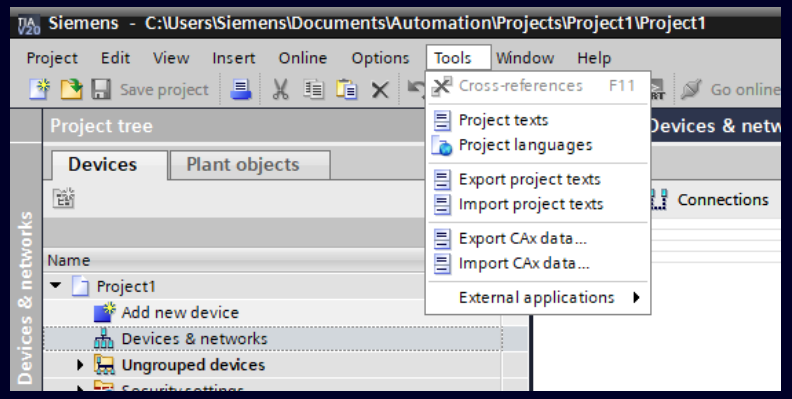
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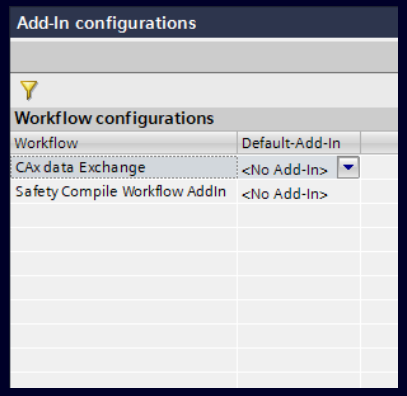
CAx: AutomationML & Publication Tools

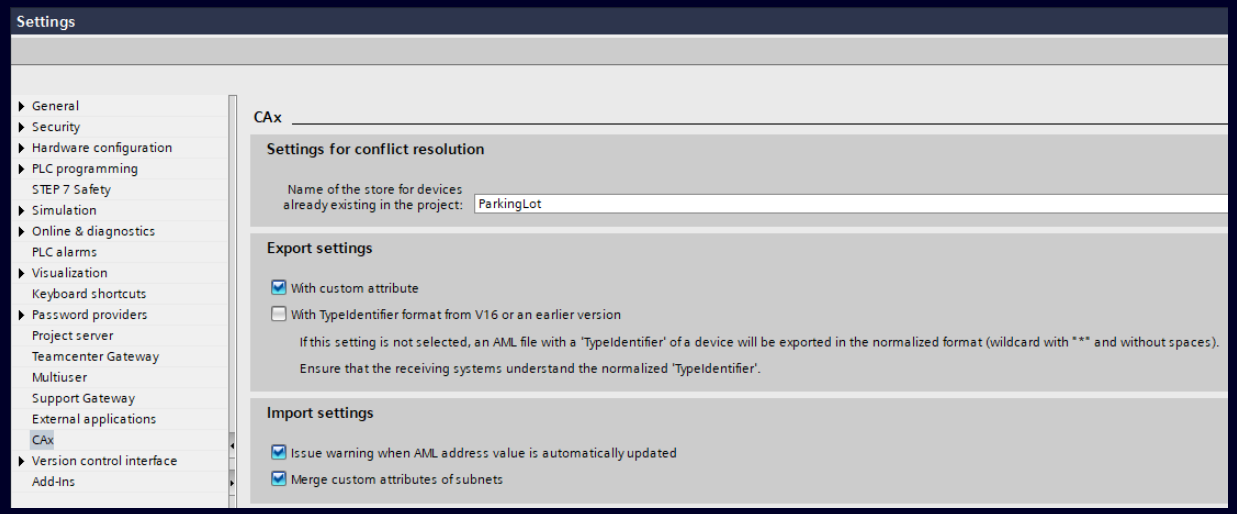
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CAx
AutomationML data exchange in TIA Portal V20







TIA Portal CAx

- The CAx interface provides you with the option of exchanging hardware information in AutomationML format between TIA Portal and ECAD systems in accordance with the Application Recommendation Automation Project Configuration (AR APC) standard.
- In addition to exchanging devices, modules and networks, selected parameters can also be exchanged with ECAD systems.
- The definitions of the available parameters can be easily determined using the CAx Publication Tools and can then be imported into other tools.

Innovations in V20

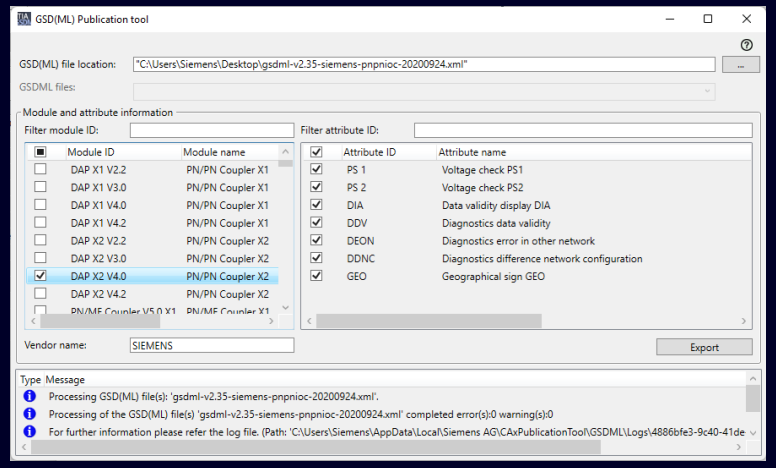
- CAx Import supports automatic opening of referred global libraries if the AutomationML file contains library references which are in ‘preview’ state in TIA Portal.
- Import of AutomationML files containing library references which are created from modules connected to master controller is supported with some limitations.
- For communication objects (interfaces, ports), the exchange of multilingual comment attributes is available using AutomationML.
- Support for CAx Add-In template is available which allows the users to create their own Add-Ins to perform custom actions during CAx Export/Import.

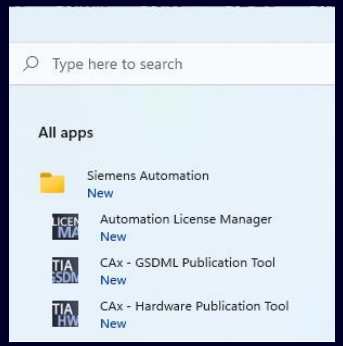
Benefits

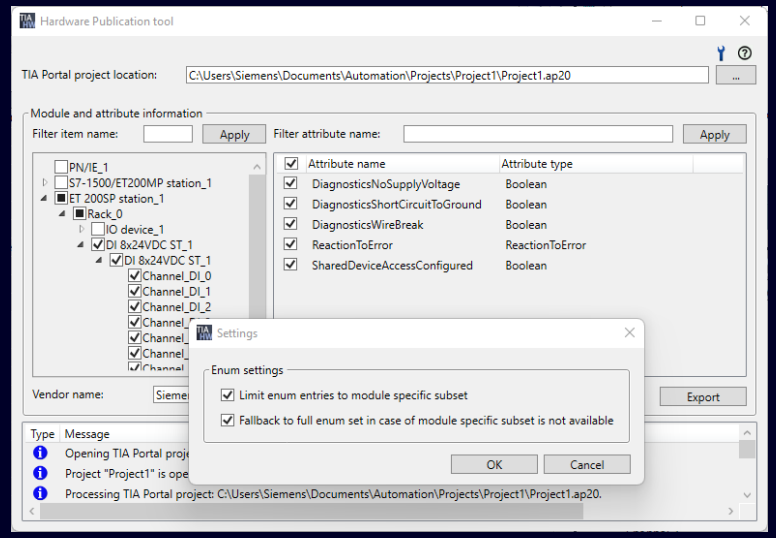
- Consistent data exchange for hardware configuration across systems, e.g. from TIA Selection Tool to EPLAN Electric P8 to TIA Portal
- Extended reuse of hardware configuration created outside TIA Portal
- Optional exchange of module and channel parameters by enabling “custom attributes”

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CAx
TIA Portal CAx Publication Tools V3.0







TIA Portal CAx Publication Tools

- The **GSD(ML) Publication Tool** can be used via GUI or Command Line to open device description files, display the device data they contain and select device attributes. These attributes can be exported with the tool as metadata.
- The **Hardware Publication Tool** can be used via GUI or Command Line to open TIA Portal projects, display the module data they contain and select module attributes. Module and channel attributes can be selected separately. These attributes can be exported with the tool as metadata.

Innovations in Version 3.0

- The exchangeable attributes can be determined for modules that are described using GSD or GSDX and made available for partner systems such as ECAD systems.
- An option to filter possible values for hardware parameters is available (preview feature)

Benefits

- Easy retrieval of available custom attributes via CAx Publication Tools
- Reuse the definition of available hardware parameter data for
  - EPLAN master data base (for custom attributes in EPLAN macros)
  - Openness applications (e.g. hardware project generators)
  - further more tools using the “Neutral” or “PcPm” formats

Order details

- The tools are part of the TIA Portal V20 installation and require an own license:
  - Version 3.0: 6ES7823-1JE03-0EA5
  - Upgrade to version V3.0: 6ES7823-1JE03-0EE5
  - Software Update Service (SUS): 6ES7823-1JE03-0EL5

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User Management & Access Control (UMAC)

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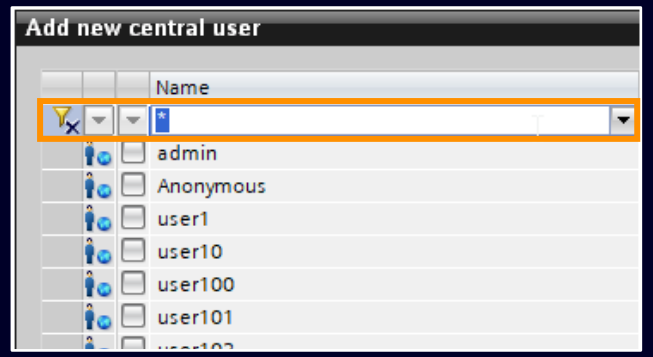
System functions
User Management & Access Control (UMAC)

The TIA Portal project offers integrated **user administration and access protection**. For consistent access protection, **user roles** can be configured with **function rights** for engineering and runtime. Users and user groups can also be managed **centrally** by connecting TIA Portal to a **UMC domain**.

New Filter central users and groups

At the import dialog for central users and groups a filter header is added.

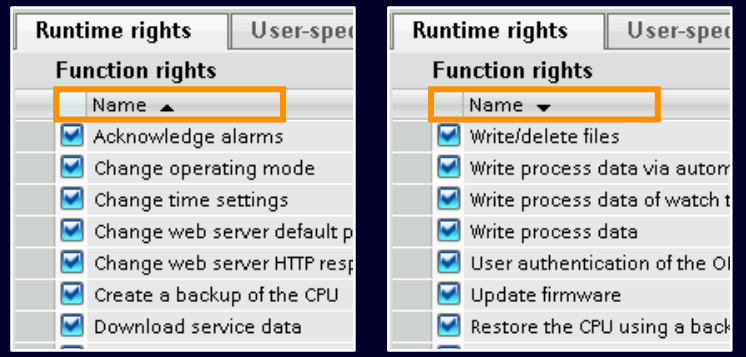
→ This helps finding specific users and groups much faster.



New Sort runtime function rights

In the table header of runtime rights, the sort order can be defined as ascending or descending.

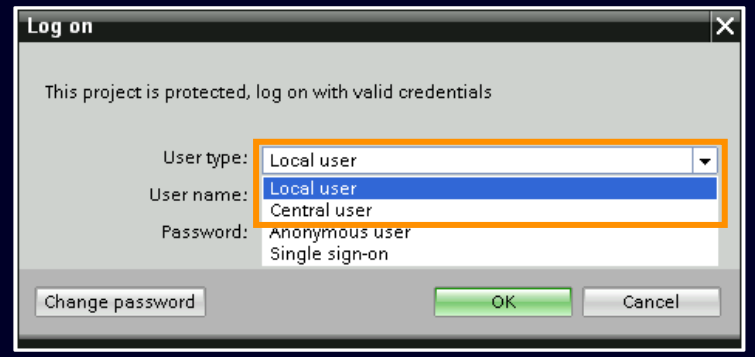
→ Sorting the list of function rights increase clearness when choosing the required entries.



New Adapted user type terminology

Rename of <Project user> to <Local user> and <Global user> to <Central user>.

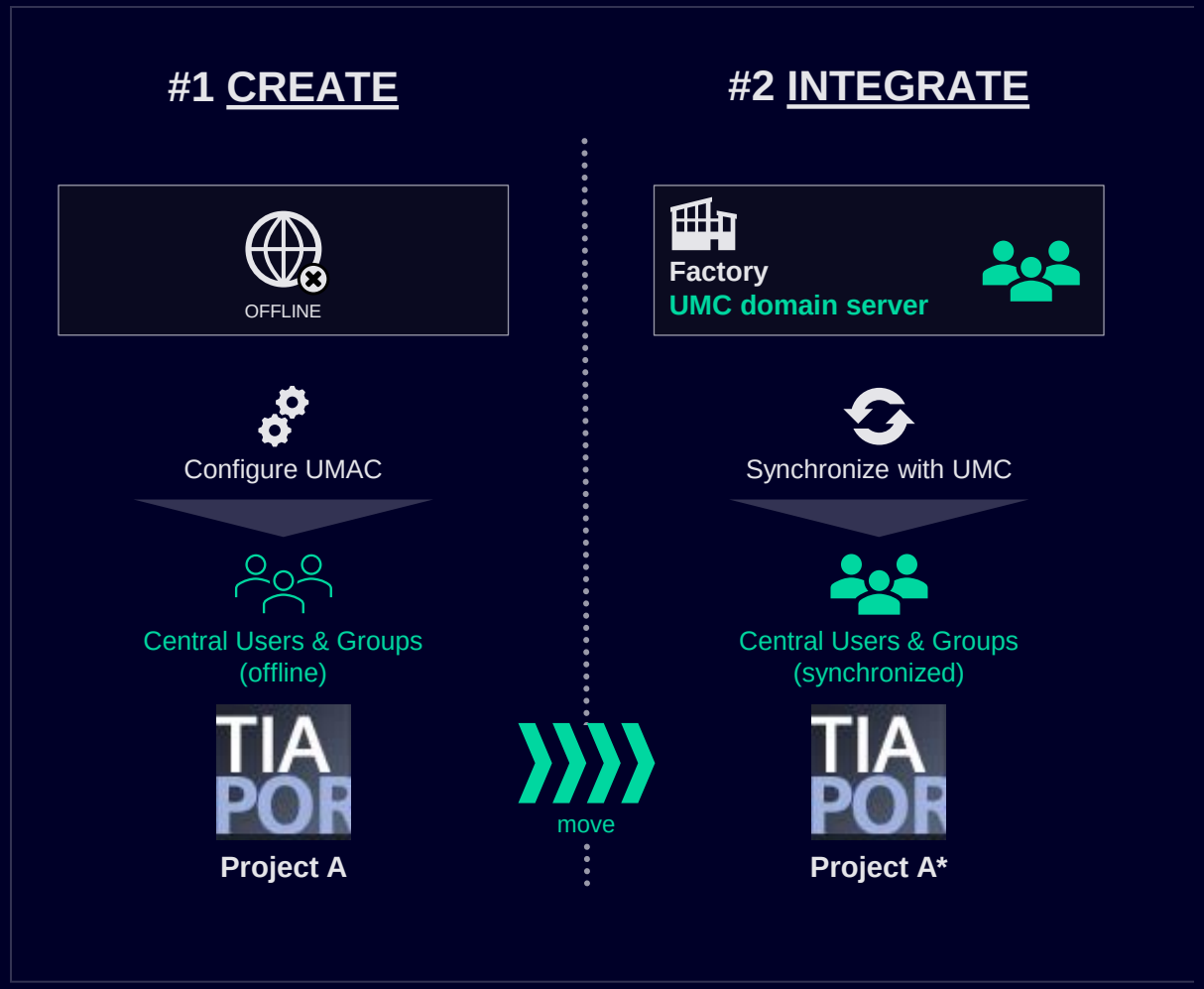
→ Consistent user terminology with UMC and UMAC supported devices.



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System functions
User Management & Access Control (UMAC)



Configure UMAC without UMC connection

Use case

- Create and manage UMC users and groups without the need to connect to a UMC domain.

Feature workflow

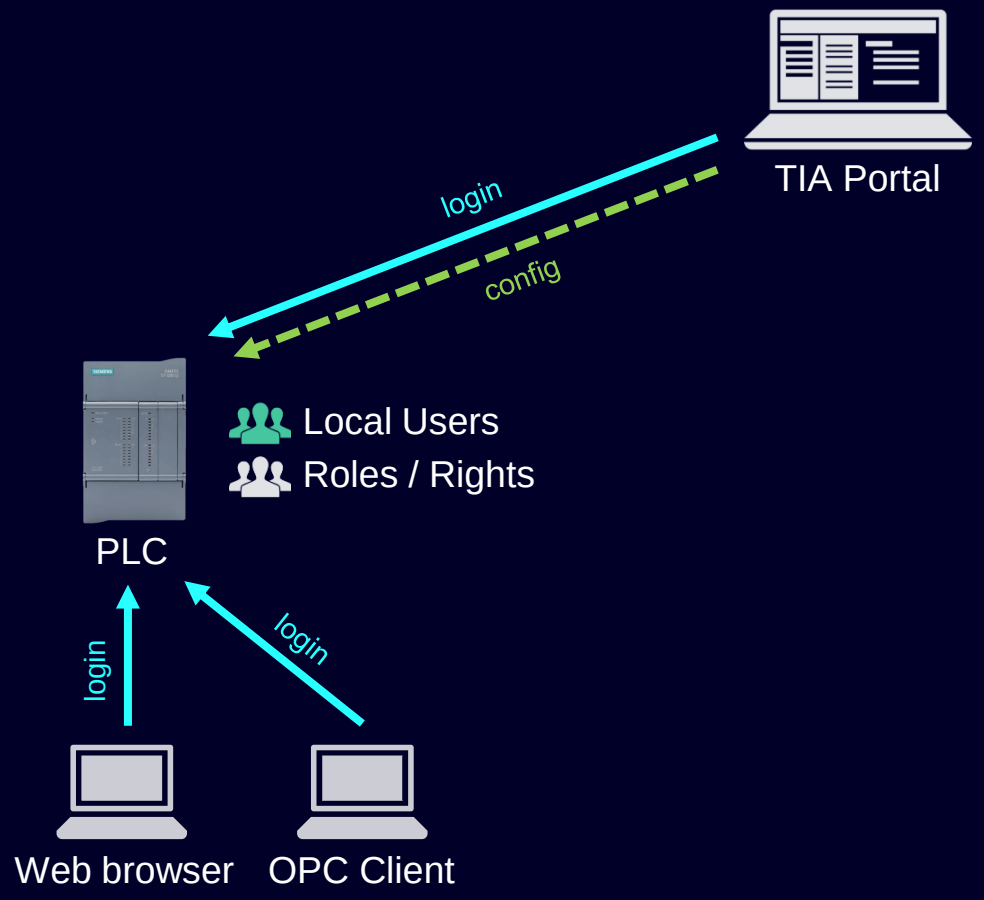
1. <Add new user> creates now by default a local user.
2. Now able to change user type from local user to central user (offline).
3. Configure access control by assigning roles for this user.
4. [Move project to place of use]
5. Use the UMC synchronize function to merge central users and groups in the TIA Portal project with the connected UMC domain.
6. Users and groups that are not available in the UMC domain stay in the TIA Portal project as disabled users.

Benefit

- Able to completely preconfigure TIA Portal projects and the UMAC configuration without a connection to a UMC domain server. This reduces the integration and commissioning effort dramatically.

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New UMAC for SIMATIC PLCs for S7-1200 / S7-1200 G2 CPUs

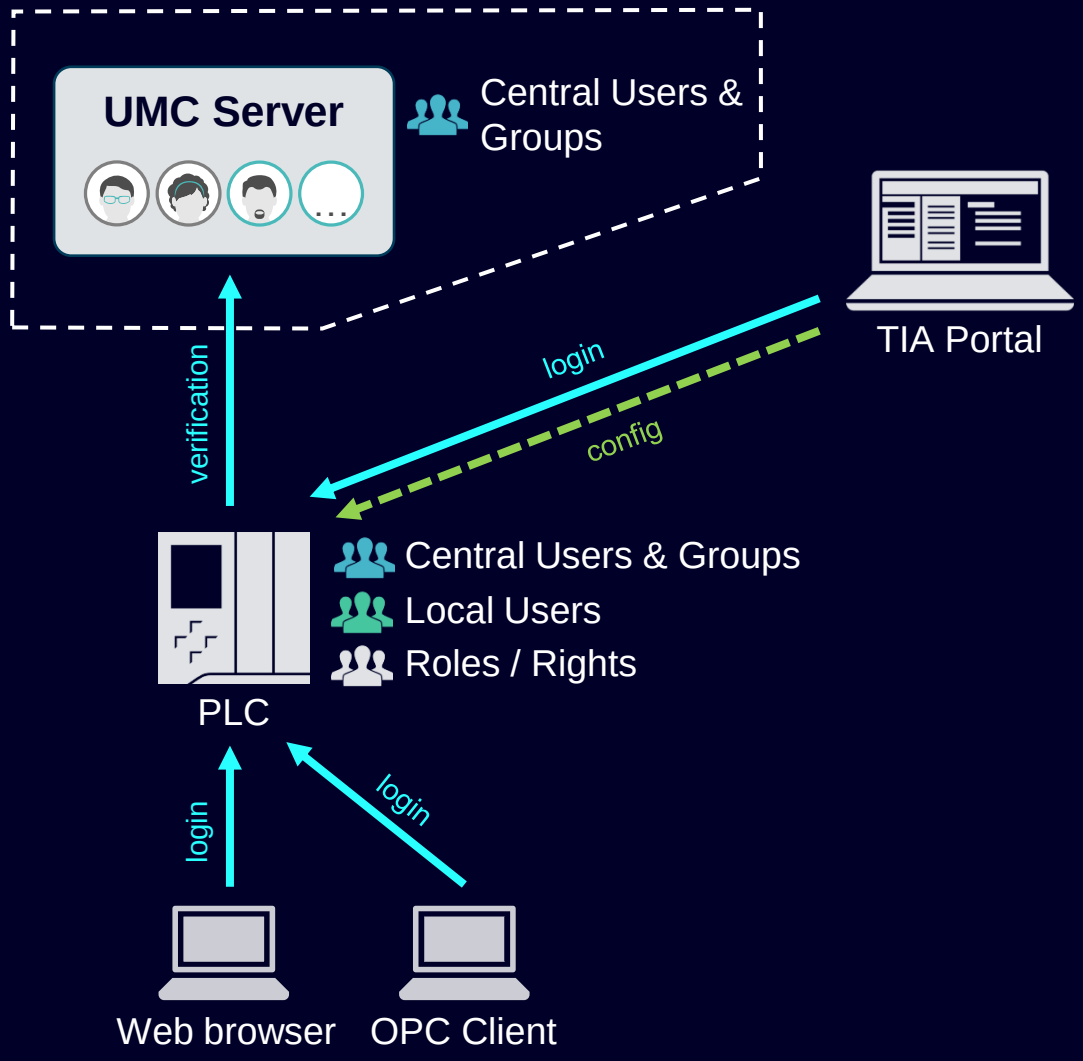


Flexible access control for multiple users, based on individual rights with unified user management:

- Unique user accounts with individual access rights for suitable access configuration according to user's tasks
- Single user account usable for different PLC services (e.g. engineering access, Webserver, OPC UA access)
- Roles / Rights concept for different PLC functionality integrated into existing TIA Portal UMAC configuration
- System defined PLC roles for easy configuration
- Improved security wizard for quick UMAC setup

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Central UMAC support for SIMATIC PLCs for S7-1500 CPUs



Flexible access control for multiple users, based on individual rights now also for larger environments:

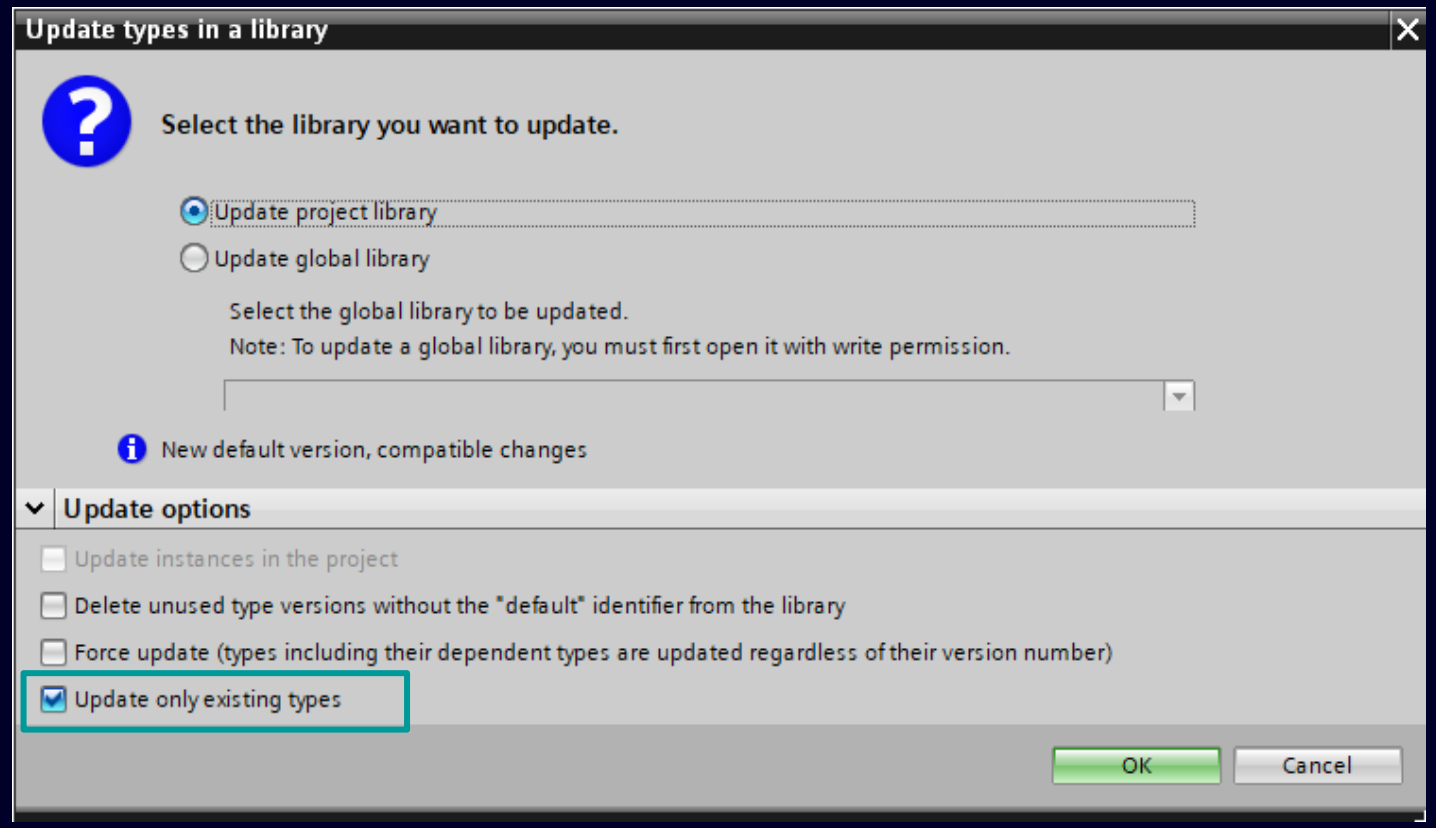
- Unique user accounts with individual access rights for suitable access configuration according to user's tasks
- Roles / Rights concept for different PLC functionality integrated into existing TIA Portal UMAC configuration
- Support of UMC for Central User Management
- System defined PLC roles for easy configuration
- Improved security wizard for quick UMAC setup
- Available for S7-1500 CPUs incl. F, T, TF, R and H variants

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TIA Portal Library Workflows

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Update only existing types from a TIA Portal global library



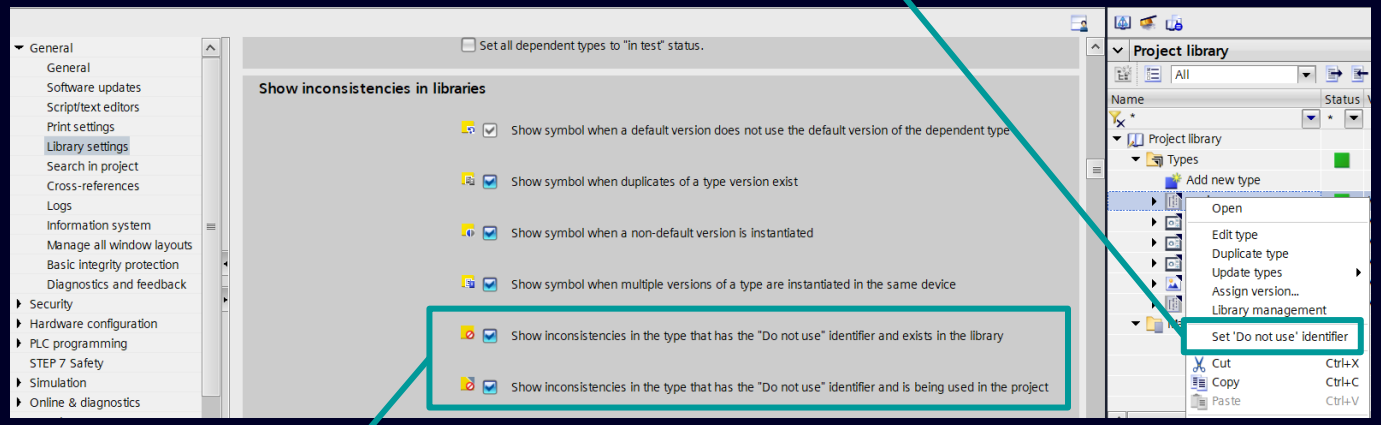
Update only existing types from a TIA Portal global library

- User can perform update operation which will update only types which exist in target (project library or global library).
- This option can be accessed in update library and update project from global library dialog box.

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TIA Portal Library types marking “Do not use”

Mark type as “Do not use”



Adjust setting for library type consistency state.

TIA Portal Library types support “Do not use” marking

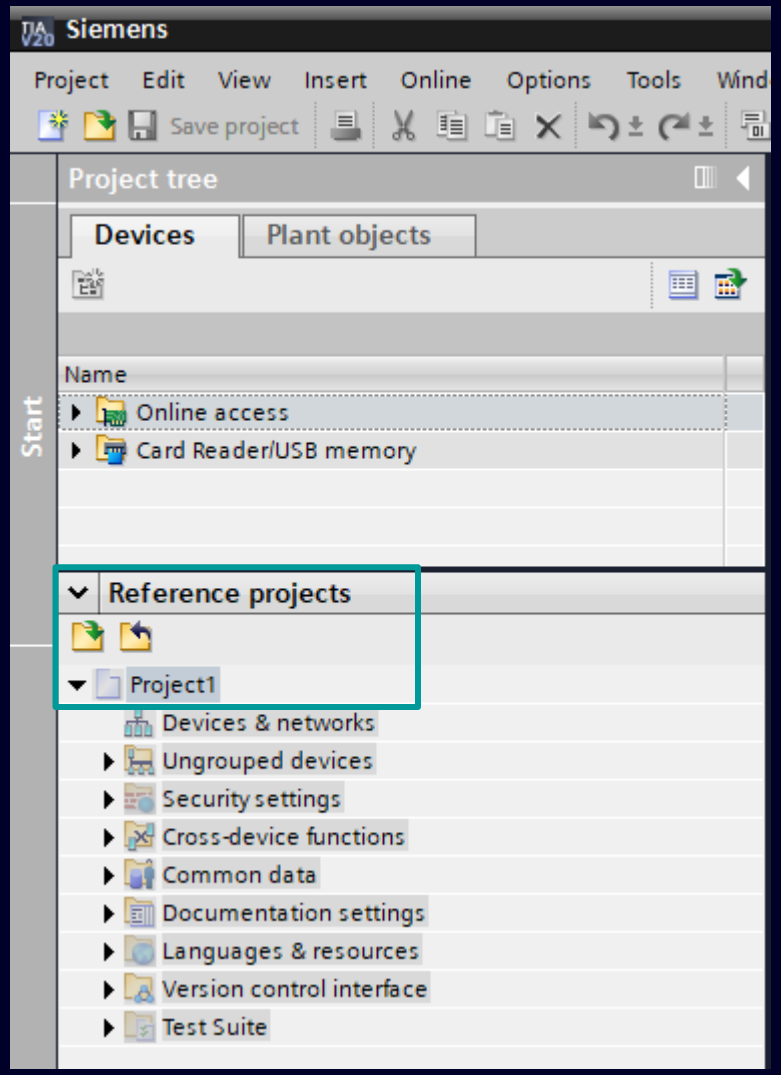
- New marking can be used to indicate e.g. a template usage of the type or mark a type as obsolete.
- Users can set “Do not use” via the context menu to apply the marking to library types.
- There are two additional library consistency settings to specify the consistency result when “Do not use” types are used in the library and / or the project.
- It is possible to filter types by using the status column.

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TIA Portal Usability

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Open read-only TIA Portal projects



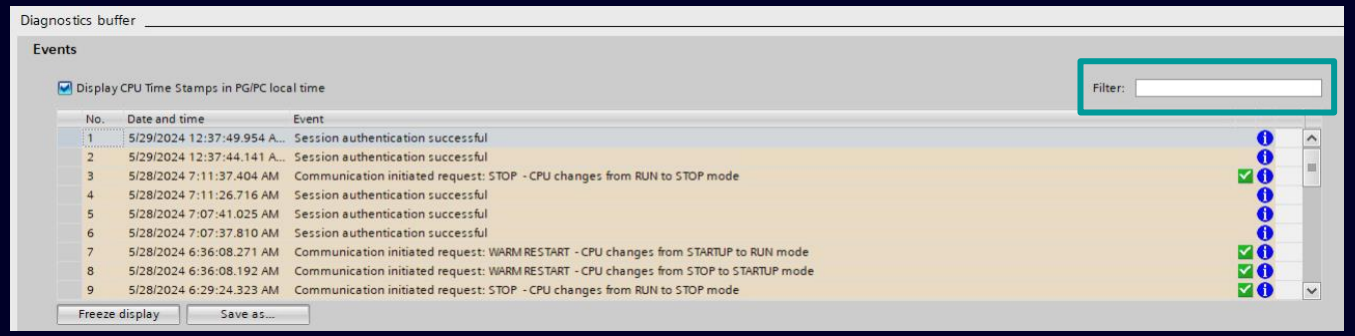
Open read-only TIA Portal projects

- If a project folder (and its contents) is read-only in Windows file system, TIA Portal will now open the project as a reference project.
- Before TIA Portal V20, the opening was canceled.

- Such TIA Portal projects can be opened
  - via “Open reference project”
  - via “Project” → “Open…” menu (new)
  - via Windows file explorer (new)

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Filter for PLC diagnostics buffer

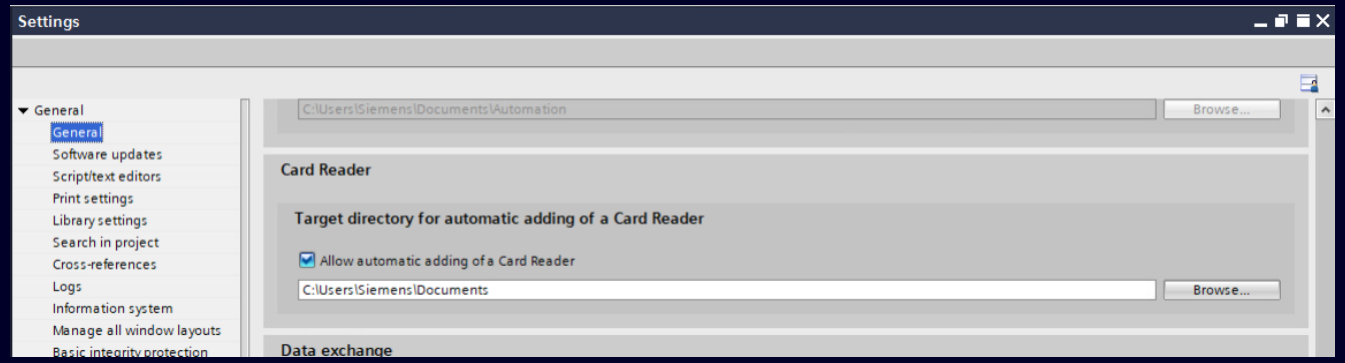


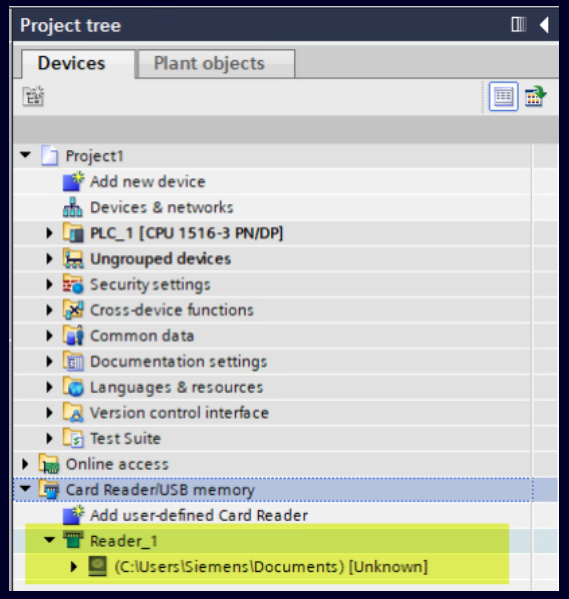
Filter for PLC diagnostics buffer

- Filter diagnostics buffer entries to simplify finding relevant events
- Filter for free text

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Persistent configuration of user-defined card reader



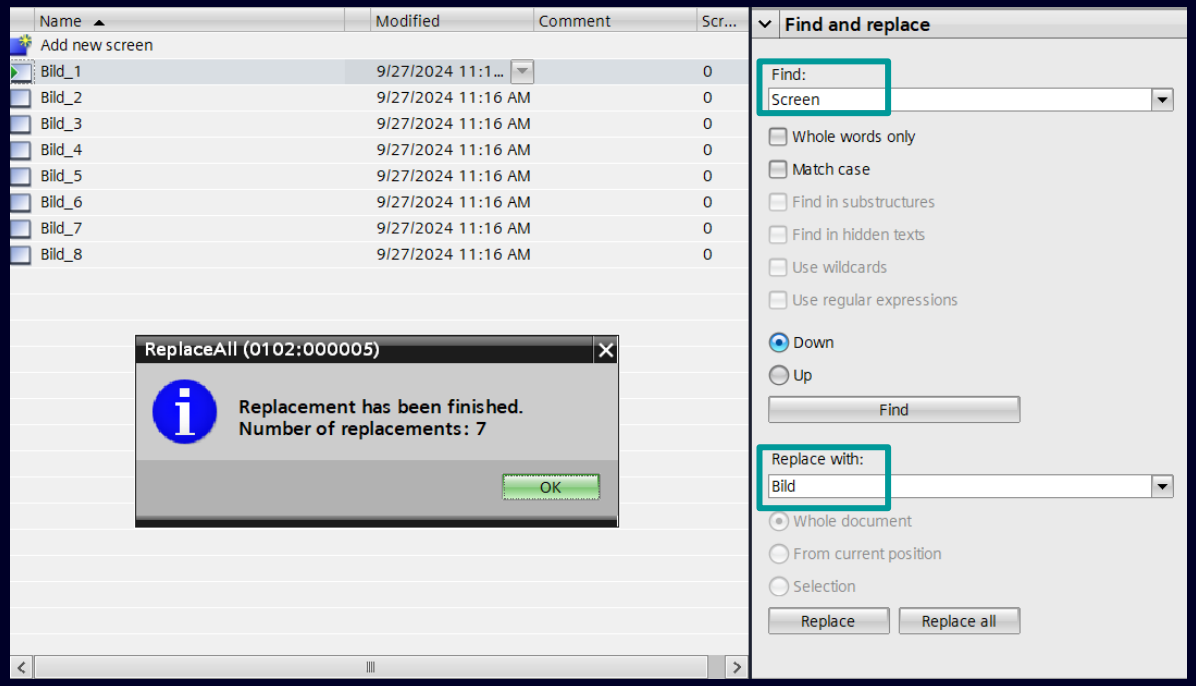


Persistent configuration of user-defined card reader

- The card reader configuration is saved under TIA Portal Settings “General”.
- The configured card reader will be automatically shown in the project tree after a TIA Portal restart.

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Project Navigator Overview – Search in Details View

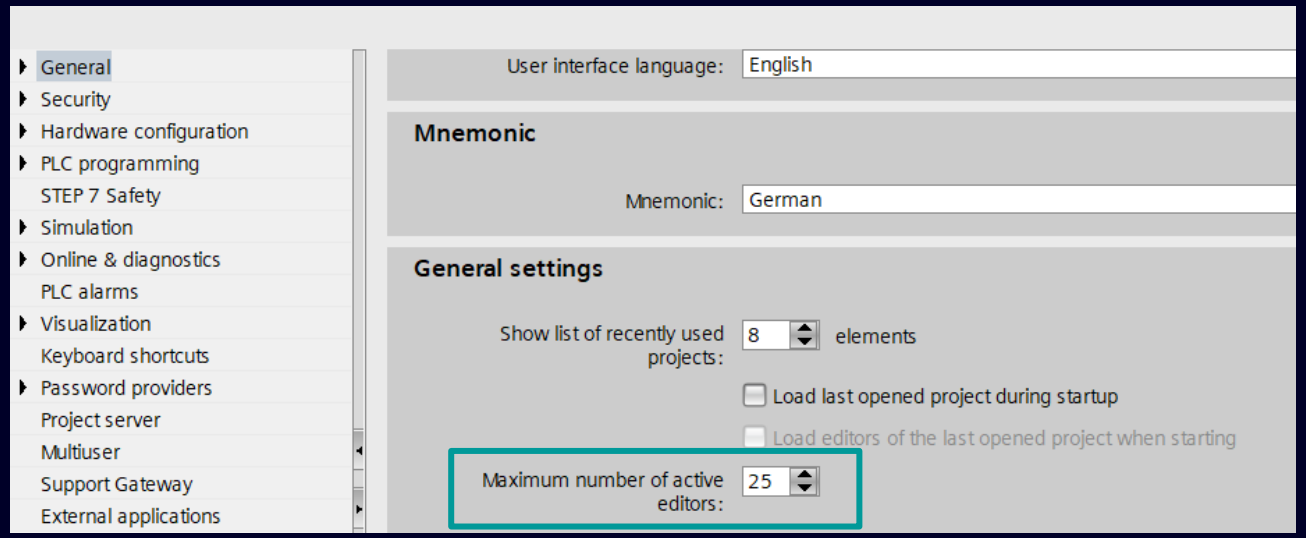


Find & Replace in Overview Editor – Details View

- Local “Find and Replace” functionality is available in Overview Editor – Details View for all columns.
- Search options “Whole Word” and “Match Case” are supported.
- “Replace” and “Replace all” is possible.

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TIA Portal Editor Handling – Resource Management

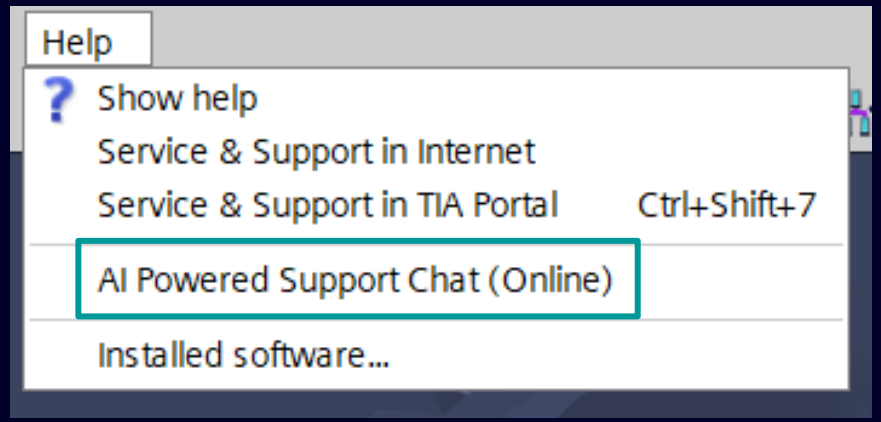


TIA Portal improved editor resource management

- The improved editor resource management allows the user to open more editors in TIA Portal without any restrictions.
- The setting “Maximum number of active editors” defines the number of latest editors kept in active state during a TIA Portal session. The editors that have not been used recently, go into a hibernated state.
- Changing the value of the setting will affect the number of active editors.
- Accessing a hibernated editor can take the same time as opening it.

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Link to AI Powered Support Chat (Online)



New help menu entry to start AI Powered Support Chat

- By pressing the button you will be directly linked to the SiePortal web page
- Multilingual Query Capability
- Comprehensive Response Delivery
  - Receive a detailed answer
  - Get a direct link to the specific file containing the information you need

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TIA Portal V20
SIMATIC AX

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V new
- Limited Sales release in USA

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

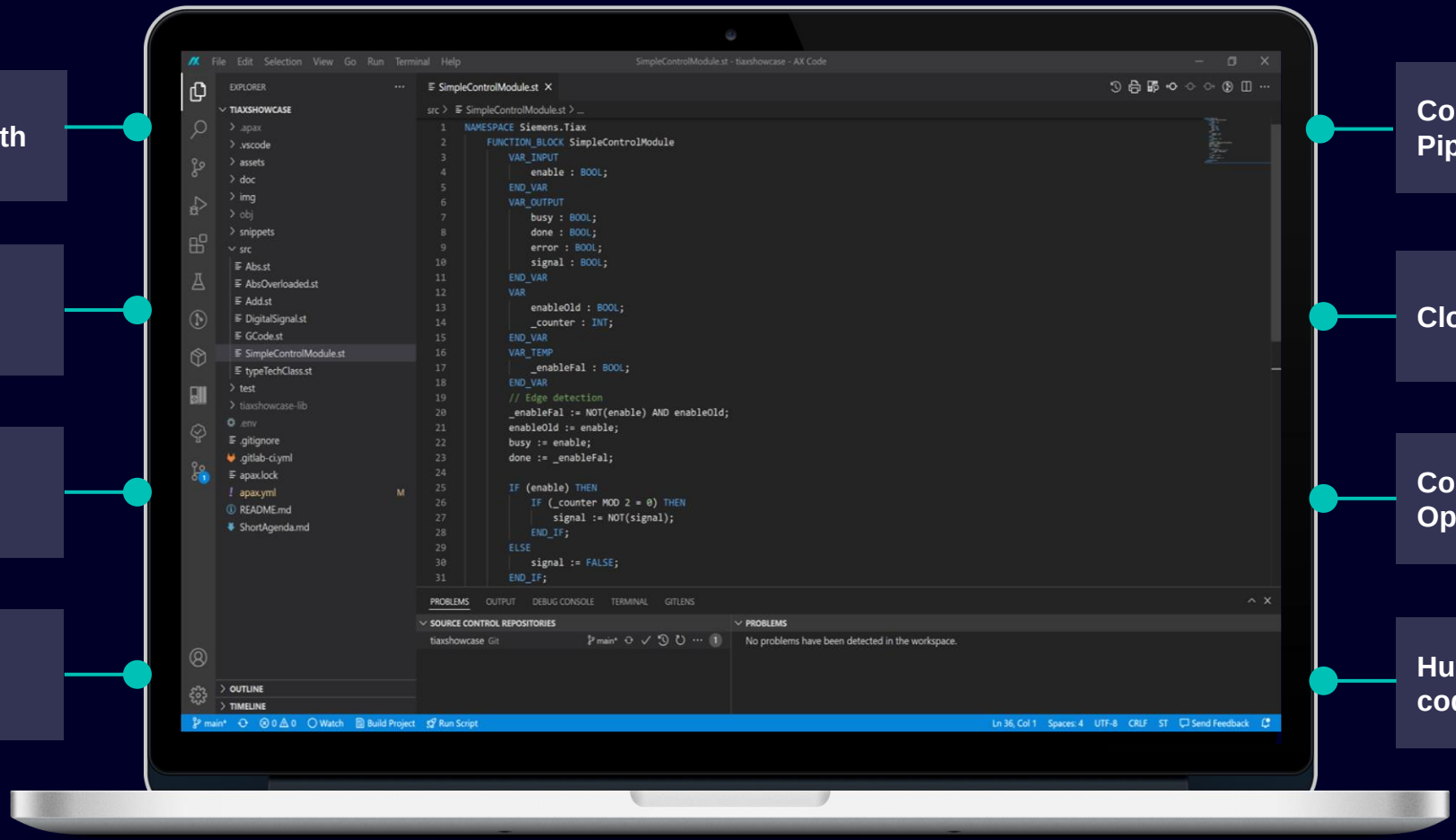
TIA Portal Options

- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
- **SIMATIC Robot Library**
- **OPC UA**
- **SIMATIC S7-PLCSIM / S7-PLCSIM Advanced**
- **SIMATIC Target for Simulink**
- **TIA Portal Test Suite**
- **SIMATIC Visualization Architect (SiVArc)**
- **SIMATIC Modular Automation (MTP)** new
- **Central User Management (UMC)**
- **Modular Application Creator**
- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

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SIMATIC AX in a nutshell

- Object-Oriented Programming (OOP) with Structured Text
- Unit Testing
- Source Control Management via GIT
- Package Management



- Continuous Integration Pipelines
- Cloud Connection
- Community approach with Open Source
- Human-readable plain-text code

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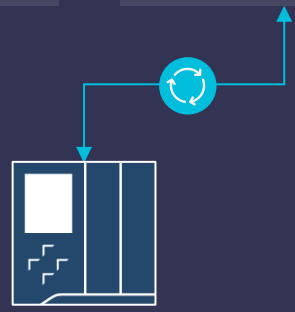
SIMATIC AX Engineering Workflows
From TIAX to IT-like PLC engineering

NEW

TIAX library development

SIMATIC AX
- Library development
- Library testing
- Library conversion into TIAP

STEP 7 TIAP
- Technology objects
- Hardware configuration
- Safety
- User-program
- HW & SW download

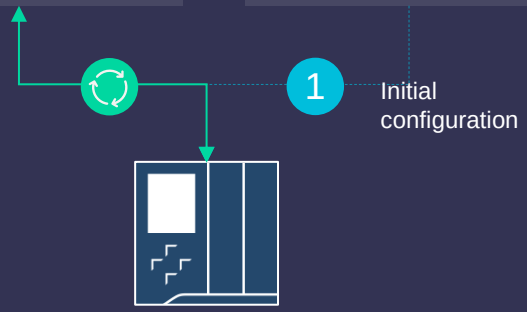


11/2022

TIAX direct application loading

SIMATIC AX
- User-program development
- Library usage
- Software download
- Monitor & Debug

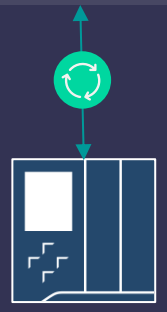
STEP 7 TIAP
- Technology objects
- Hardware configuration
- Hardware download



11/2023

IT-like PLC engineering

SIMATIC AX
- First PLC configuration + download
- User-program development
- Library usage
- Software download
- Monitor & Debug



06/2024

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Supported Hardware (as of 11/2024)

Supported Hardware
CPU 1511-1 PN (6ES7 511-1AL03-0AB0, V3.0 and V3.1)
CPU 1513-1 PN (6ES7 513-1AM03-0AB0, V3.0 and V3.1)
CPU 1515-2 PN (6ES7 515-2AN03-0AB0, V3.0 and V3.1)
CPU 1516-3 PN/DP (6ES7 516-3AP03-0AB0, V3.0 and V3.1)
CPU 1517-3 PN/DP (6ES7 517-3AP00-0AB0, V3.0 and V3.1)
CPU 1518-4 PN/DP (6ES7 518-4AP00-0AB0, V3.0 and V3.1)
all PROFINET-devices (incl. drives) for which GSDML files are provided, regardless of manufacturer
this includes the complete SIEMENS ET200SP, ET200MP and even legacy systems
S7-1500V NEW

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Rollout & Availability
Limited Sales Release[1]

Europe

- Germany
- France
- Netherlands
- Belgium
- Italy
- Spain
- Portugal
- UK
- Austria
- Ireland
- Bulgaria
- Czech Republic
- Poland
- Sweden
- Switzerland
- Denmark
- Finland
- Norway
- Croatia
- Hungary

America

- USA

Asia

- China (mainland)

1 No free market access of SIMATIC AX. All SIMATIC AX projects must be aligned with DI FA according to the defined process. Please contact your local DI FA SSP.

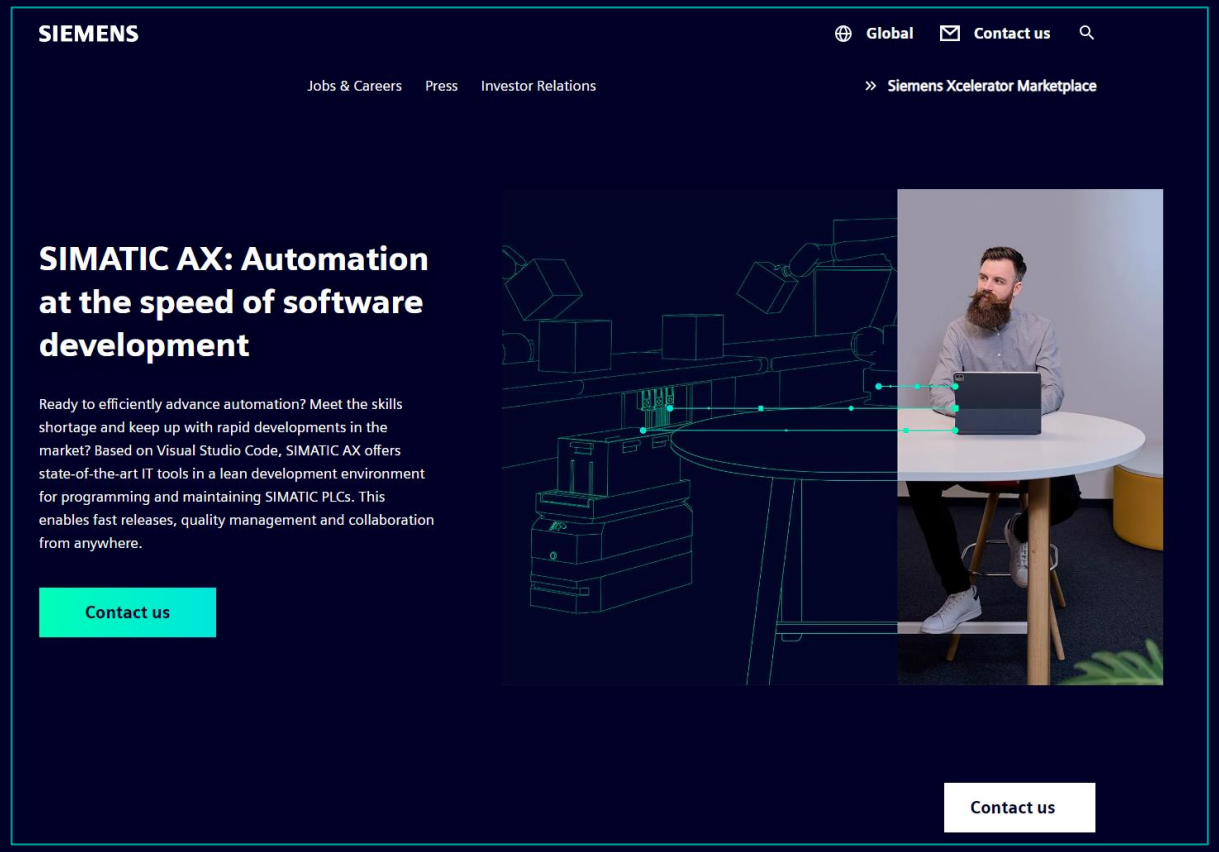
SIEMENS

Want to know more?
Visit the SIMATIC AX website on Siemens.com

Visit SIMATIC AX

www.siemens.com/simatic-ax

Click here



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TIA Portal V20
TIA Portal Options

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V new
- Limited Sales release in USA

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

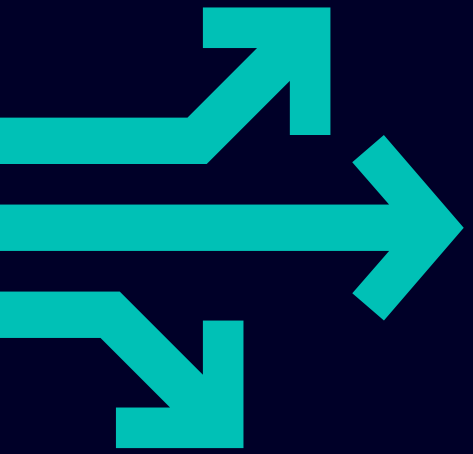
TIA Portal Options

- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
- **SIMATIC Robot Library**
- **OPC UA**
- **SIMATIC S7-PLCSIM / S7-PLCSIM Advanced**
- **SIMATIC Target for Simulink**
- **TIA Portal Test Suite**
- **SIMATIC Visualization Architect (SiVArc)**
- **SIMATIC Modular Automation (MTP)** new
- **Central User Management (UMC)**
- **Modular Application Creator**
- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

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TIA Portal V20
TIA Portal Options

Content

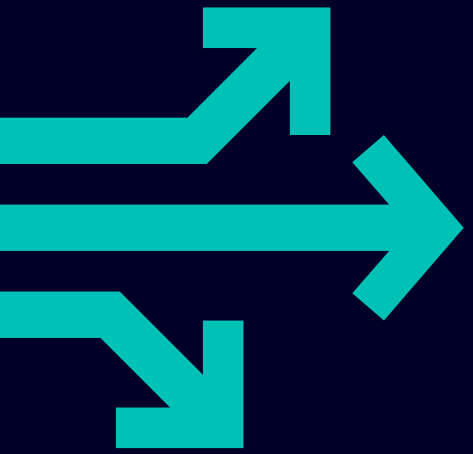


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TIA Portal V20
TIA Portal Options

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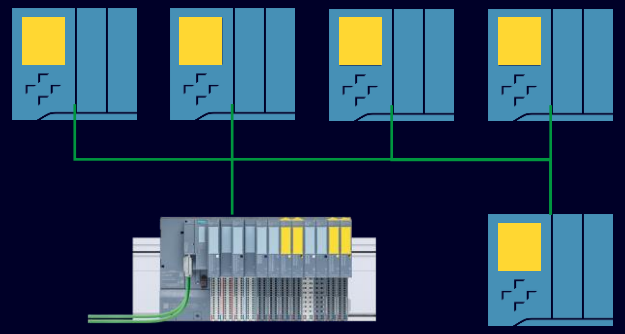


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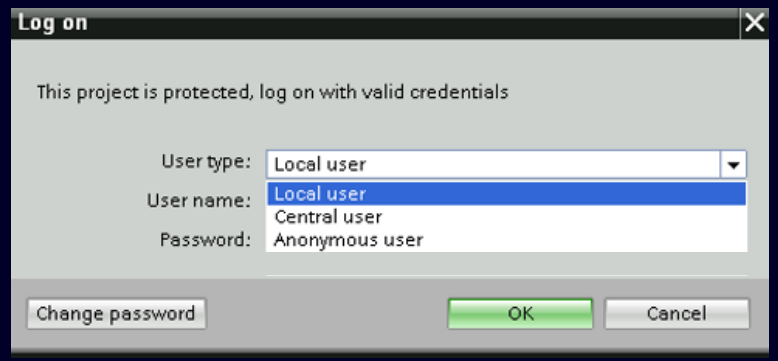
SIMATIC STEP 7 Safety

Integrated shared (I-) device



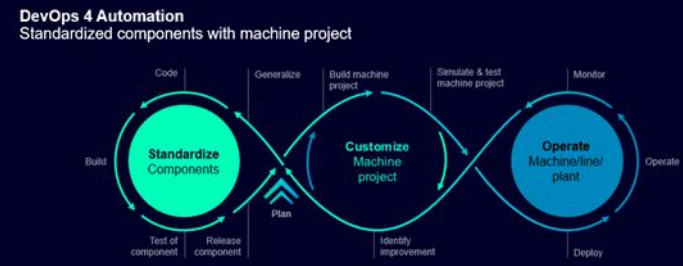
- Configuring of maximum 4 IO-Controller in one TIA-Project possible (instead of 2 based on V19)
- Upload in one TIA-Project possible for shared device & shared I-device
- The communication module CM1542-1 can be used as IO-Controller in Shared Device configurations

User management access control



- Support for runtime authentication via UMC server for all S7-1500 Failsafe PLCs
- Support for local UMAC authentication for S7-1200 Failsafe PLCs
- With UMC user groups changes of runtime failsafe user configuration without download are possible
- Active directory integration via UMC possible for runtime authentication on S7-1500

CI-Support for F-LAD

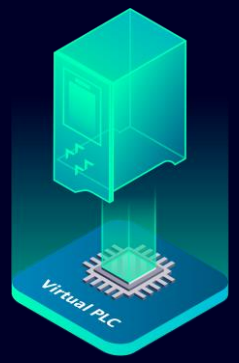


- Human readable representation of graphical code
- Source code only – no internal meta information
- Version independent syntax
- Works for F-LAD, LAD & DBs & UDTs
- Accessible via Openness

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SIMATIC STEP 7 Safety

New PLCs
(151xVF and 1200G2)



Time Service App

Virtual Failsafe SIMATIC S7-1500F PLC

- Hardware independence
- TIA Portal compatible
- App Management over IT/Edge

S7-1200F G2

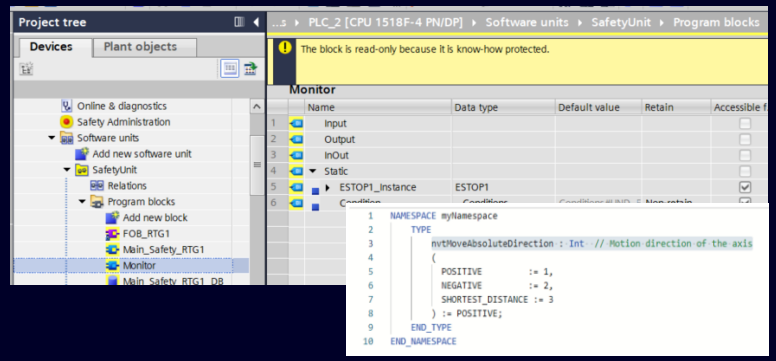
- Integrated in the complete range
- Improved F-IO Portfolio with F-SBs and mixed F-I/O modules
- Integrated in STEP 7 Basic

STEP 7 Safety Basic license



- S7-1200F seamlessly integrated in STEP 7
- No separate Safety license required from V20 onwards for S7-1200F
- Reduce entry costs
- STEP 7 Safety Basic will be discontinued from V20 onwards

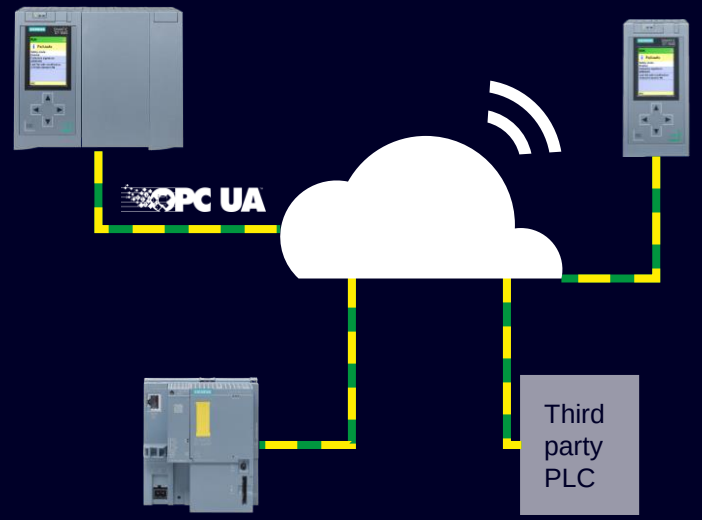
Named value types
(NVT)-support for safety

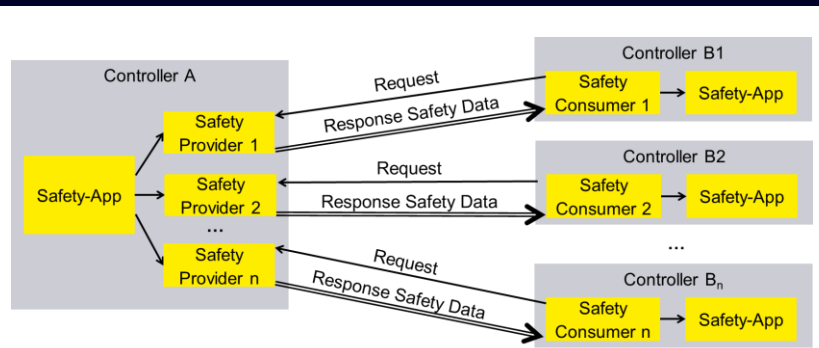


- Know-how protection for Safety blocks utilizing NVTs
- Safety blocks utilizing NVTs may be used in type library (when not know-how protected)

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OPC UA Safety
Applications requiring a peer-to-peer safety communication





Will be delivered with V20 update (exp. Q2/CY2025)

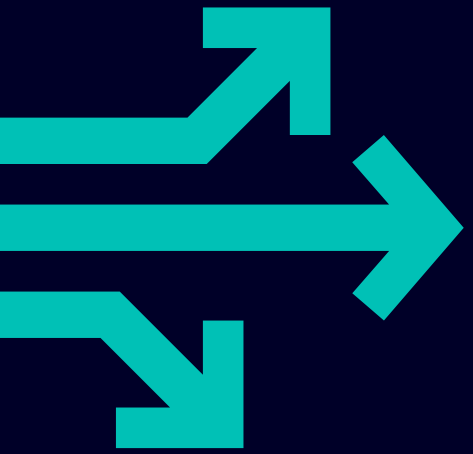
NEW

- **Fail-safe Controller-to-Controller (C2C) communication based on OPC UA for S7-1500F CPUs**
- **Vendor independent failsafe communication**
- **Flexible failsafe communication:**
  - Changing communication partners during runtime
  - Not limited to layer 2 networks
  - Global Unique Identifier (BaseID) for safety addressing
- **Dedicated application example for OPC UA Safety will be provided**
- **Focus applications:**
  - Infrastructure / AGVs / Remote control / Oil&Gas / Chemical
- **Limitations due to non deterministic nature of OPC UA**
  - Varying response times of typically >= ~500ms (increased safety timeout necessary)
  - Response times are CPU dependent and influenced by encryption and other communication

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TIA Portal V20
TIA Portal Options

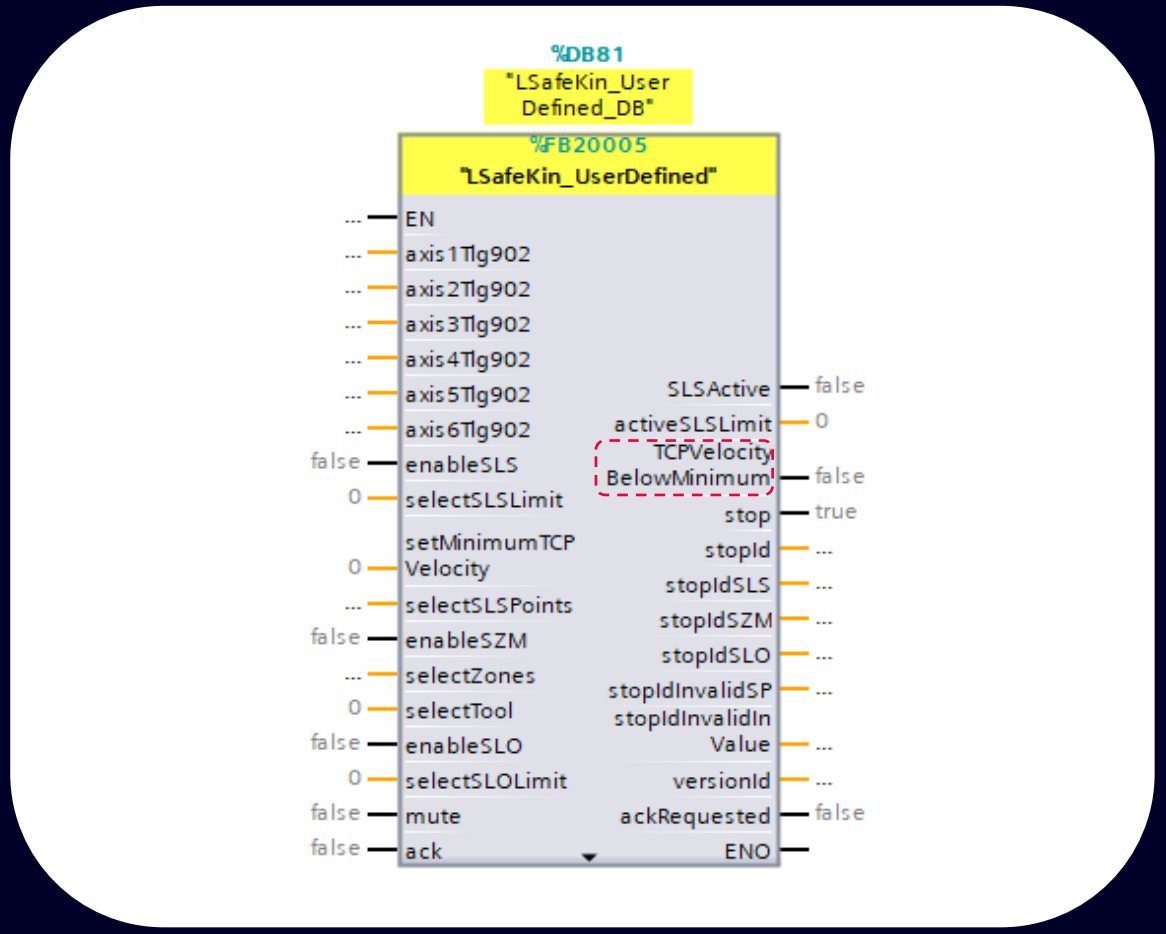
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SIMATIC Safe Kinematics and SIMATIC Safe Kinematics for SPU
New Safety function for User-defined Kinematics



Monitor too fast and too slow

- The Function block **LSafeKin_UserDefined** monitors not only if a velocity limit was exceeded but now additionally, if a minimum velocity is maintained at the TCP
- In case the velocity is below the limit, the user program can react accordingly

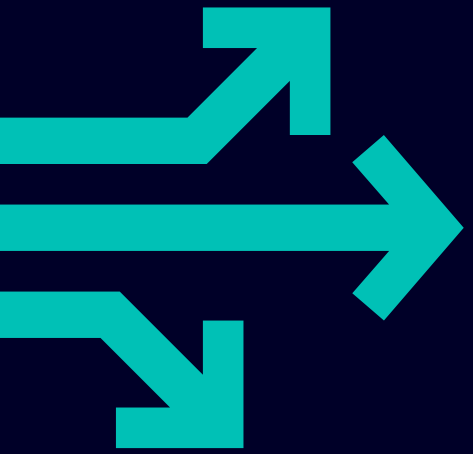
Benefit

- In applications like laser cutting, a violation of minimum velocity can be handled safely in the User program for example by turning off the laser.

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TIA Portal V20
TIA Portal Options

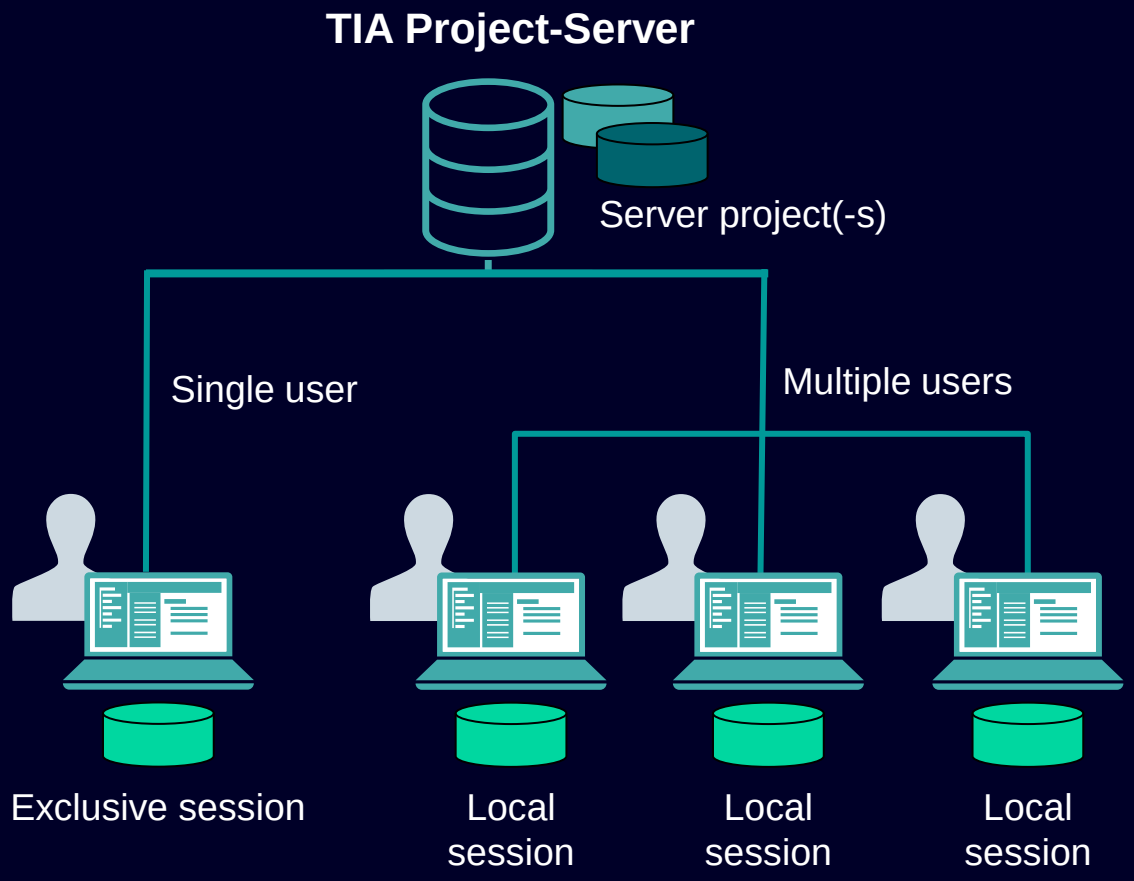
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TIA Portal Multiuser Engineering
Enhanced functions and improved workflows



Multiuser engineering in TIA Portal enables simple collaboration on TIA Portal projects or libraries in engineering and commissioning.

Working together on TIA Portal projects significantly shortens configuration times and enables faster commissioning. You avoid time-consuming sending of data or coordination of changes.

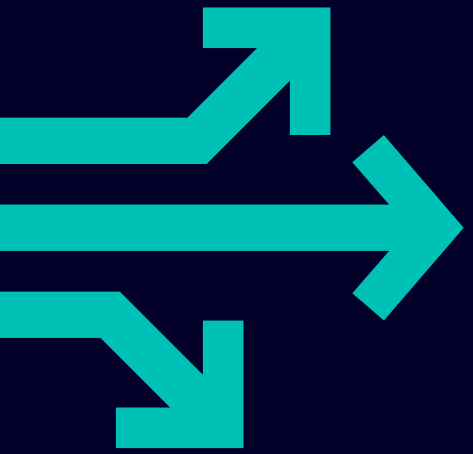
Benefit in V20

- Integration of the Kerberos network authentication.
- Expansion of the Synchronous Commissioning Mode to include both Exclusive Session and Exclusive Multiuser Mode within the Multiuser Session.
- Enhancement of Openness functions to allow marking and unmarking of Multiuser objects and to facilitate collaboration with project server groups.
- Improved performance for project server connections, as well as during the creation and check-in of workflows.
- Automatic return to online mode following a successful check-in and refresh.
- Overall performance enhancements.

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TIA Portal V20
TIA Portal Options

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SIMATIC Robot Library
Supporting manufacturers



Available In progress Pending

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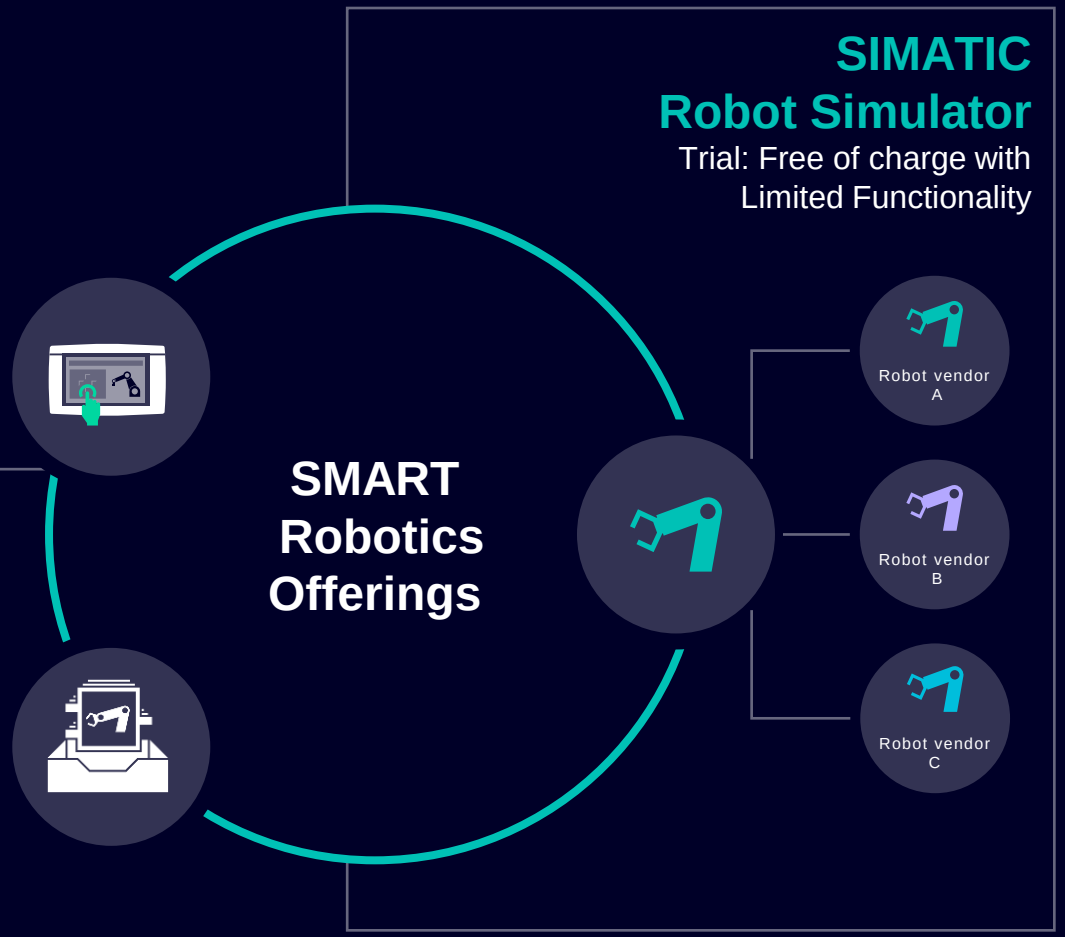
Siemens Smart Robotics
Now making robot simulation more accessible

SIMATIC
Robot Integrator

Free of charge

SIMATIC
Robot Library

- Trial: Free of charge for 8h
- Single Runtime license
- One license per robot arm



The **Robot Simulator** helps you to start with the **Robot Library** in the easiest way possible while enabling you to set up your entire cell virtually

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SIMATIC Robot Simulator
Functions

SIMATIC Robot Simulator



Use the SIMATIC Robot Simulator to increase the value of the SIMATIC Robot Library significantly

Functions

- SRCI based, cross vendor, virtual robot controller
- Seamless integration with existing SIMATIC portfolio
- Validation of robot paths incl. their sequence in early stage of the project regarding
  - Cycle time analysis
  - Singularity detection
  - Reachability analysis

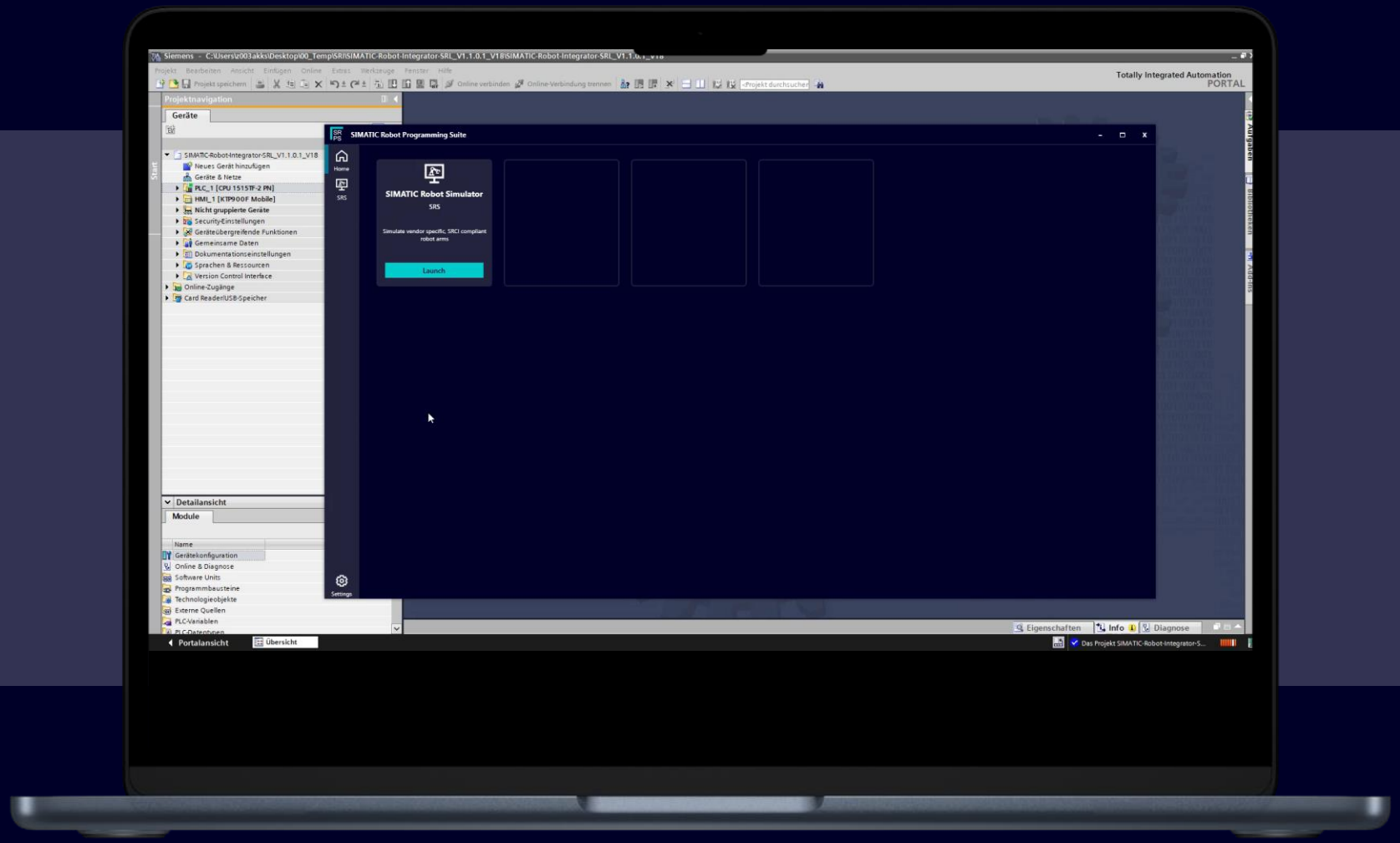
Products & Solutions

- SIMATIC Robot Simulator
- SIMATIC Robot Library
- SIMATIC S7-PLCSIM Advanced
- SIMATIC Robot Integrator

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Demonstration of SIMATIC Robot Simulator

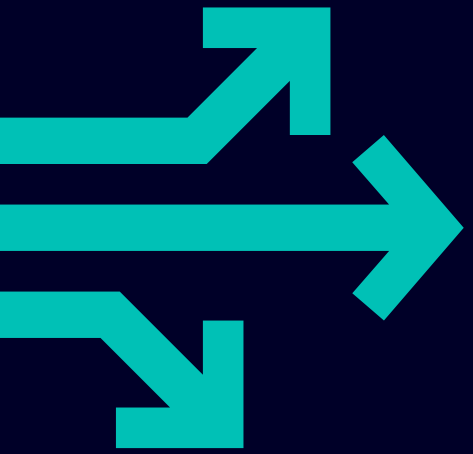
Discover how easy and quick the setup with SRS is



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TIA Portal V20
TIA Portal Options

Content



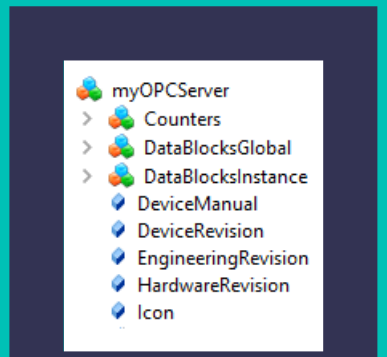
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OPC UA – improvement with V20 / FW V4.0

Overview of all new OPC UA features for S7-1500 PLCs

OPC UA Highlights



Quantity structures & Performance *)	• Increased number of nodes for user-defined server interfaces • Increased number of possible server methods • Higher performance for Read, Write and Subscriptions
Access control	• Support of access rights for individual OPC UA user • High flexibility to make data available to authorized users only
Alarms & Conditions	▪ Alarms & events in individual language by different OPC UA users ▪ subscribe to 1 out of 3 languages, selectable by the OPC UA client ▪ subscribe all 3 languages at ones in parallel (to be consistent)
Subscription Handling	• Load balancing between different clients • Subscription can be transferred to other available OPC UA clients
Interface modeling	• TIA Portal Add-In for fast & easy creation of user-defined interfaces • Replacement of generic SIMATIC server interface with user-defined interfaces

*) new S7-1517/1518 HW only

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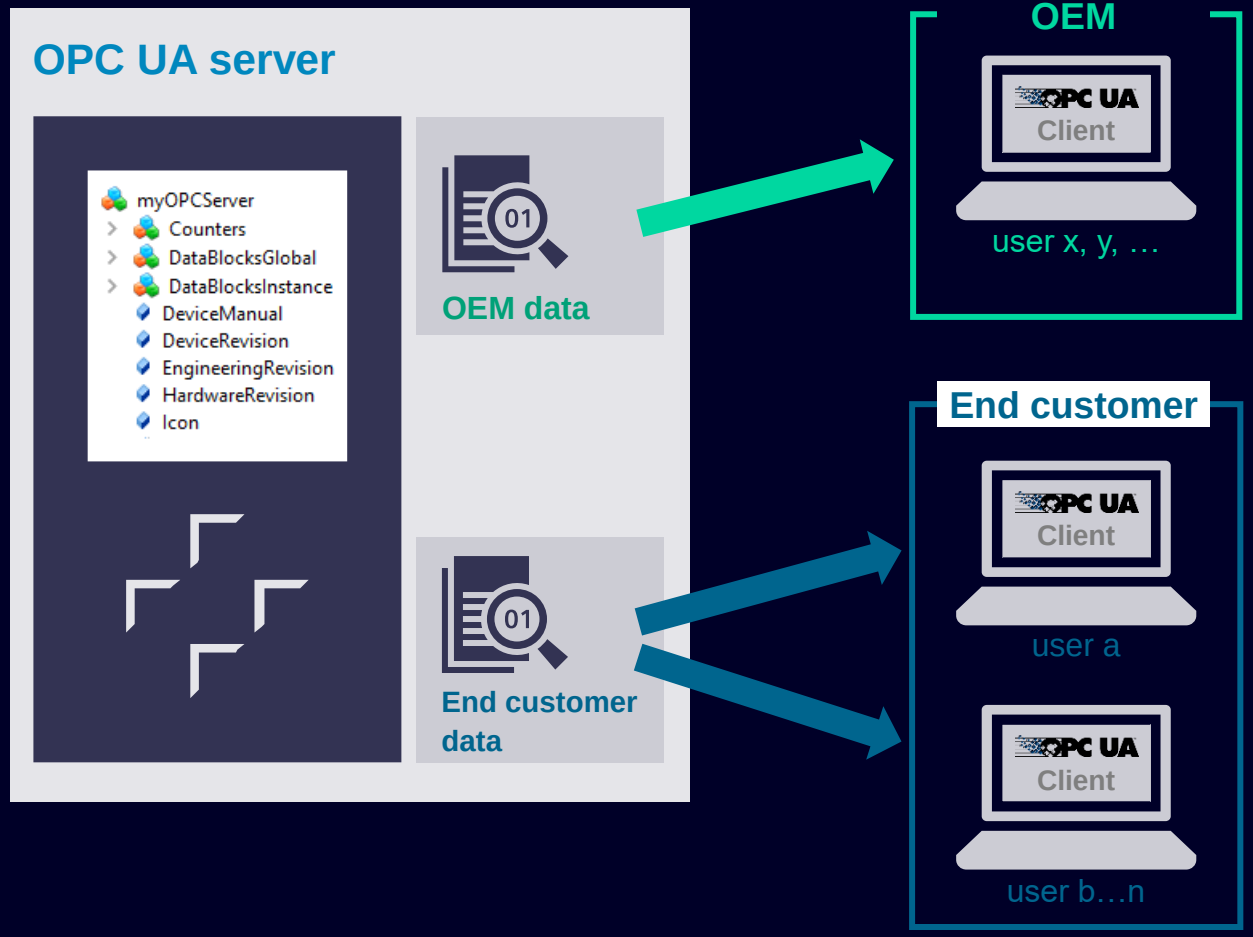
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OPC UA improvements V20 / FW 4.0
Higher performance & increased quantity structures

	CPU 1517	CPU 1517 (new)	CPU 1518	CPU 1518 (new)
Improvements quantity structures				
User-defined server Interface				
No. of server interfaces	10	10	10	10
No. of nodes for user-defined server interfaces	30,000	**100,000**	30,000 / 50,000 (V19)	**200,000**
Subscriptions				
No. of subscriptions per session	50	50	50	50
No. of monitored items, total	50,000	50,000	50,000	**60,000**
Methods				
No. of server methods	100	**4,000**	100	**8,000**
No. of parallel running server methods, max	20	***100***	20	**200**
No. of in/outputs per server method	20	20	20	20
Improvements performance				
Read, Write		**up to factor 4 faster**		**up to factor 3 faster**
No. of monitored items (with 1s sampling/publish interval)	10,000	**50,000**	10,000 / 24,000 (V18)	**60,000**

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OPC UA – User & Roles
Defined access to variables by different OPC UA users



Support of access rights for individual OPC UA user

Definition of access rights at the OPC UA server

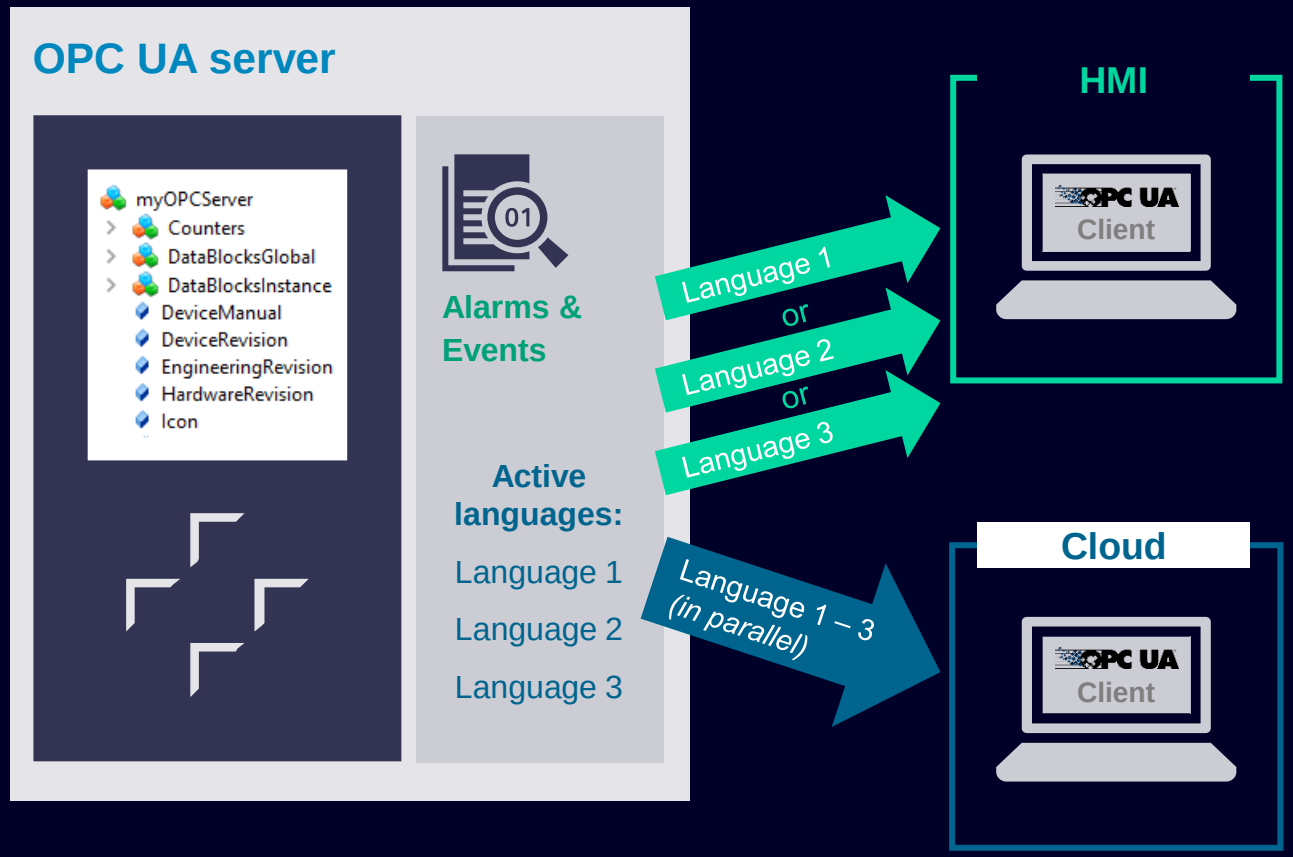
- for each OPC UA client / role individual
- based on node set or interfaces
- pre-defined in user information model (e.g. Companion specs, using SiOME)

Benefits

- High flexibility to make data available to authorized users only
- Quick & easy engineering within TIA Portal
- Access management based on UMAC concept (local and central user management)

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OPC UA – A&C multi language support
Alarms & events in individual language by different OPC UA users



Use Cases

A) plant & machine control

get information about any issues and production stops or periodical alarms and maintenance

- subscribe to 1 out of 3 languages, selectable by the OPC UA client

B) predictive maintenance

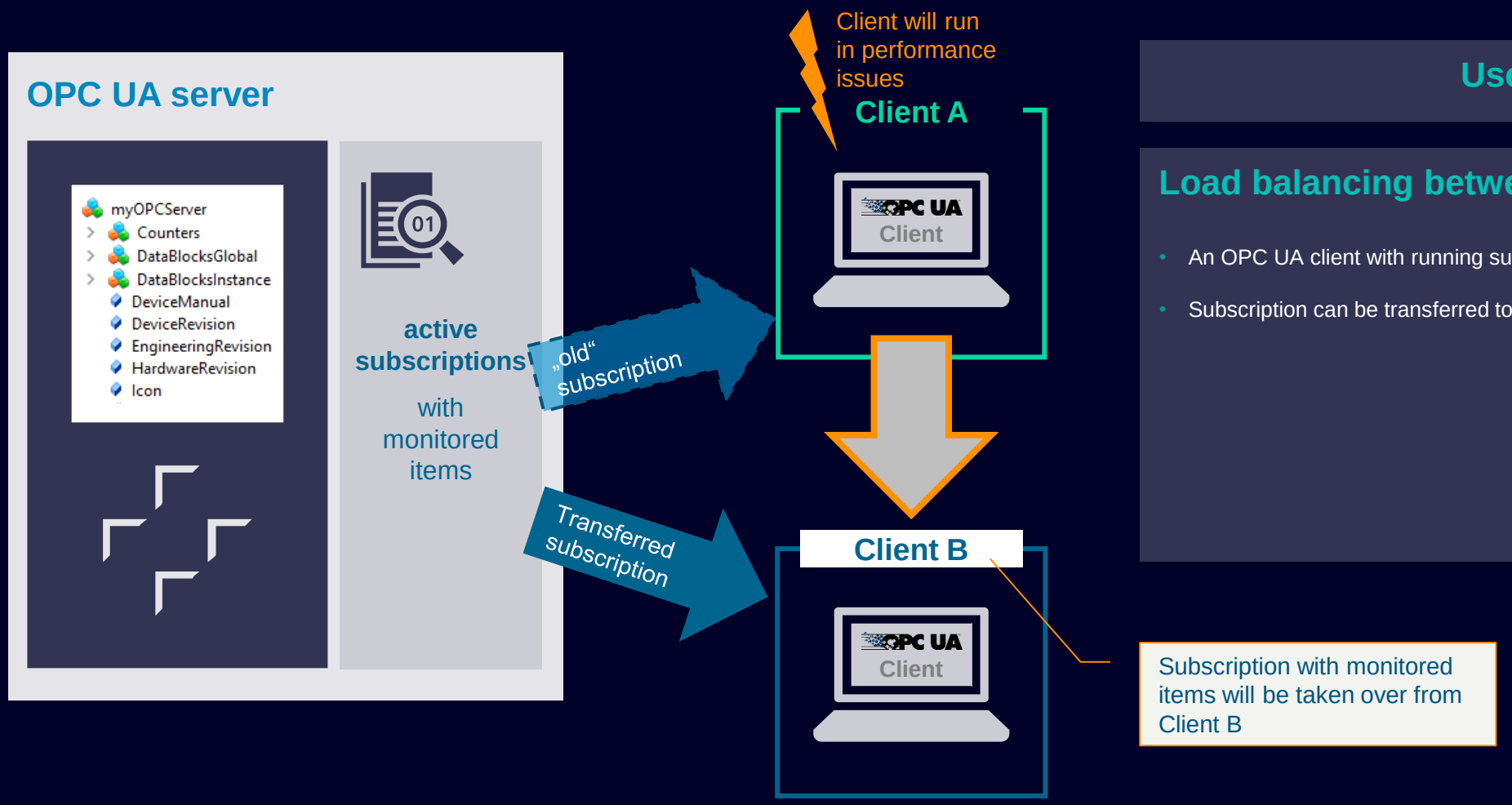
user would like to collect all alarms & events in a central data system for investigations

- subscribe all 3 languages at ones in parallel (to be consistent)

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OPC UA – Transfer Subscription
Handling of subscription by the external clients



Use Cases

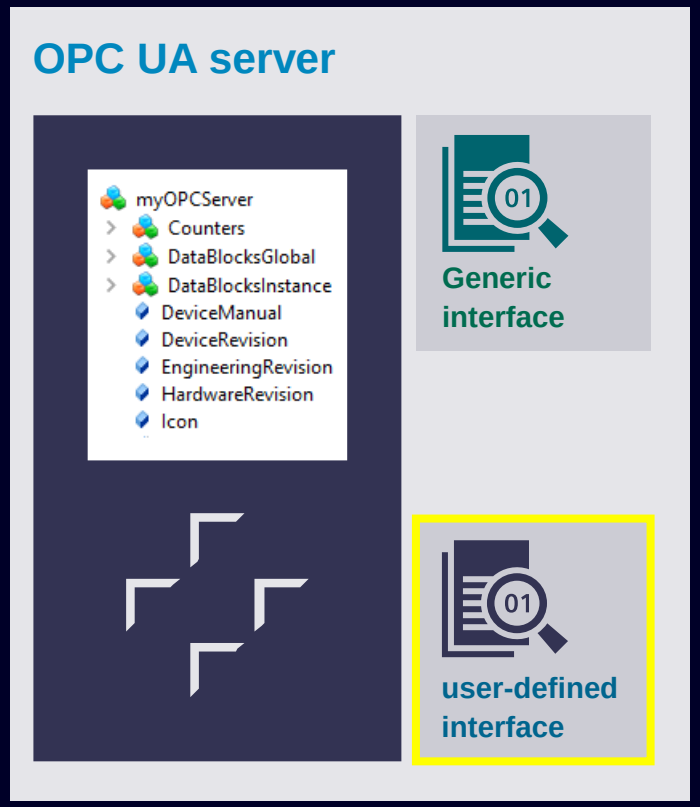
Load balancing between different clients

- An OPC UA client with running subscription gets performance issues
- Subscription can be transferred to other available OPC UA clients

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OPC UA – TIA Portal Add-In for user-defined interfaces
Fast & easy creation of user-defined interfaces



New TIA Portal Add-In creates a user-defined interface for OPC UA server

Enhanced performance
- Replacement of generic SIMATIC server interface with user-defined interfaces that offers improved performance

Automatic interface generation
- Create server interfaces for S7-1200 and S7-1500 R/H PLCs which do not support the generic SIMATIC server interface

Customization to fit project needs
- Provide flexibility by allowing customization of the server interface to meet specific project requirements

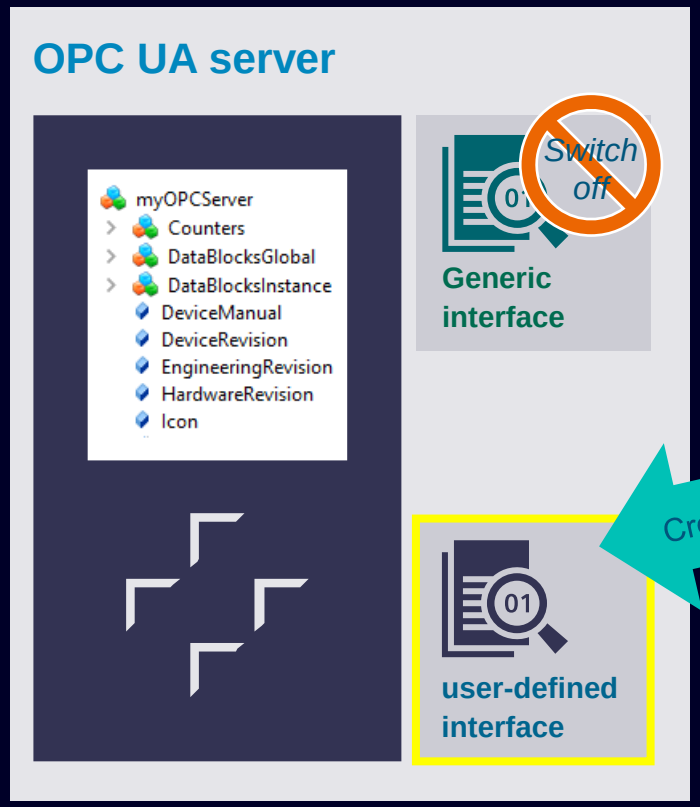
Download

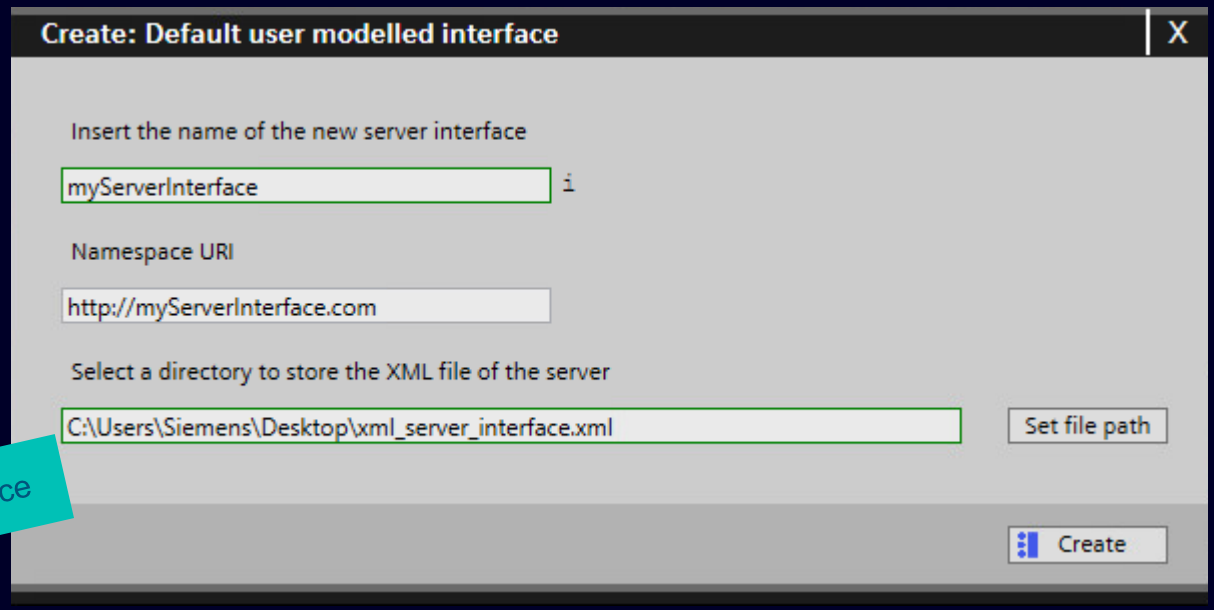
TIA Portal Add-In has been published on GitHub:

https://github.com/tia-portal-applications/tia-addin-opc-ua-modelled-interface

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OPC UA – TIA Portal Add-In for user-defined interfaces (2)
Fast & easy creation of user-defined interfaces





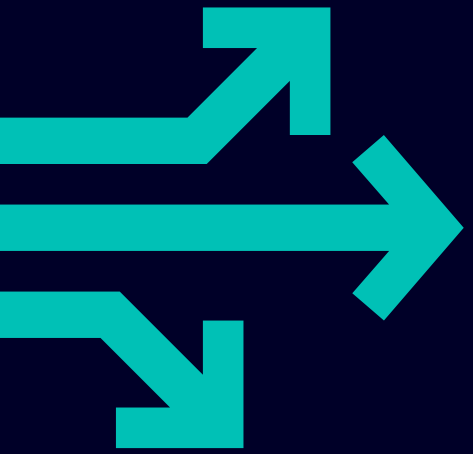
New TIA Portal Add-In creates a user-defined interfaces for OPC UA servers, based on all variables that are accessible via OPC UA

- arranges nodes in a structured manner
- eliminating the need for manual configuration
- significantly reducing time and effort

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TIA Portal V20
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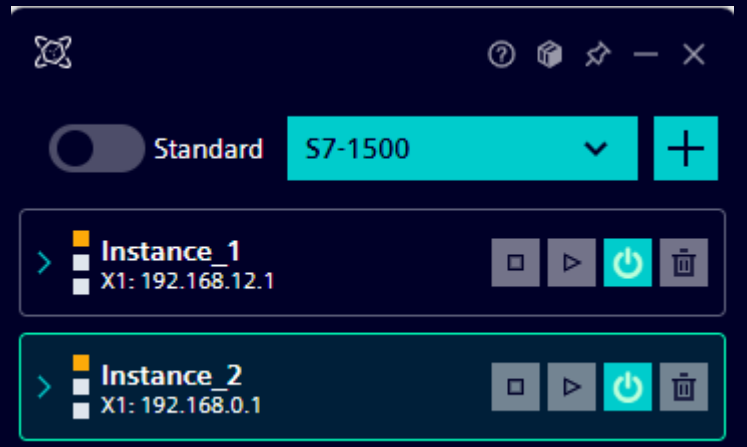
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S7-PLCSIM V20
Enhanced new User Interface support Standard and Advanced Customers

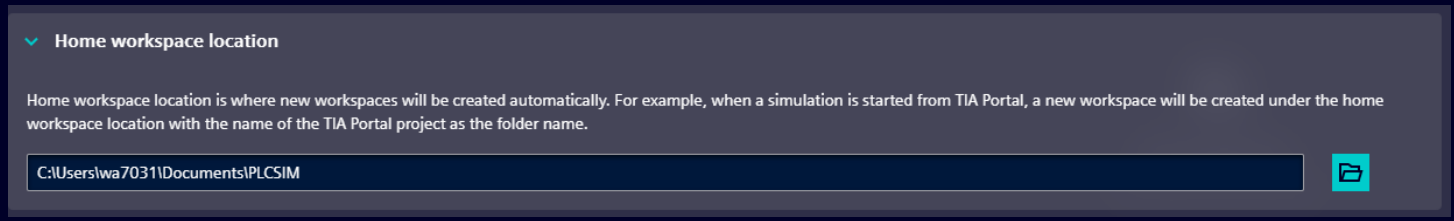
Key Enhancements SIMATIC S7-PLCSIM V20:

- Expanded Hardware Support:
  Now compatible with the latest **S7-1200 G2** and **new S7-1500 PLC** variants, ensuring seamless integration with the most recent hardware.
- Updated Firmware Compatibility:
  Full support for the latest firmware versions in both S7-1200 and S7-1500 controllers.
- Improved Migration:
  Easily import sequences from older PLCSIM versions to maintain continuity in your projects.
- Efficiency with Shortcuts:
  Boost your productivity with newly introduced keyboard shortcuts for faster navigation and control.
- Improved User Interface:
  A refreshed interface provides a more intuitive experience, with both S7-PLCSIM Standard and Advanced* functionalities integrated.

Essentials View: Focus on what matters most with the new Essentials View. Minimize the UI to display only the list of PLC instances, and keep it pinned for quick access. Creation of new instances can be done here directly.
This new view can be used as PLCSIM Advanced Control Panel. Even, once a PLC instance in Advanced mode is started, this instance is shown on the Essential View.



Improved Workflow: Save time with a more streamlined startup process. PLCSIM can now be launched directly without the need to create or save a workspace, simplifying your workflow.



* S7-PLCSIM Advanced license required

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S7-PLCSIM-Advanced V7.0
Key enhancements

With SIMATIC S7-PLCSIM Advanced, virtual controllers for simulating S7-1500 based controllers can be created and used for extensive simulation of functions.

Key Enhancements SIMATIC S7-PLCSIM Advanced V7.0

- Expanded Hardware Support:
  Compatible with the latest innovated S7-1500 Hardware PLCs 1516T / 1517 / 1518 CPUs with their bigger quantity structures in program and data memory - ensuring seamless integration with the most recent hardware.
- More precise simulation through feature configuration support.
  Any new PLC instance behaves after the first project download in terms of PLC memory and other specific resources like tags as the corresponding real PLC. No bigger program can be downloaded anymore to the simulation as to a real PLC. Behaving as a real PLC includes that overloading with another PLC type is not possible.
- Extended Compatibility:
  TIA Portal projects from versions V14 to V20 as well as CPU firmware versions V1.8 to V4.0 are now supported.
- Streamline API Versions:
  Supporting the API versions from V3.0 to V7.0 by carving out the earliest legacy variants.

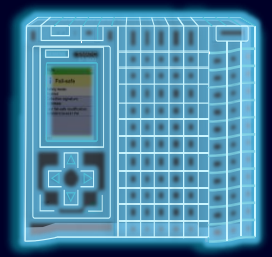


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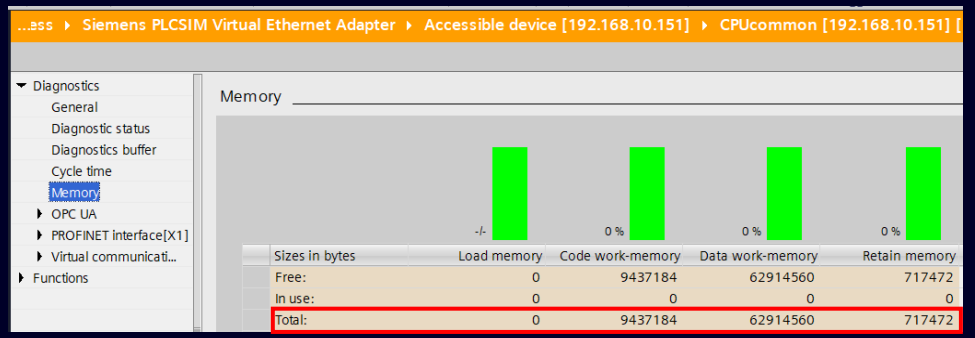
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S7-PLCSIM-Advanced V7.0
More precise simulation 1/2

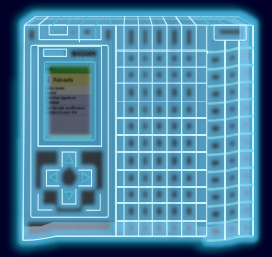
Previous behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



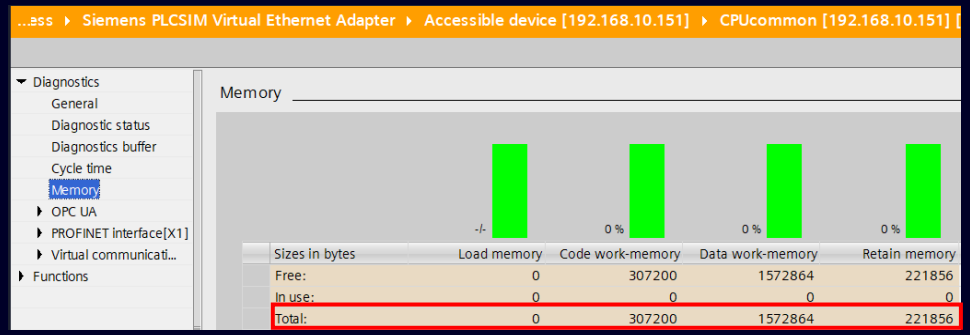
Always Maximum memory allocated



New behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



Exact memory allocated for selected CPU



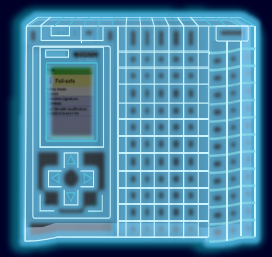
Previous behavior
S7-PLCSIM Advanced allocates for any PLC type the maximum quantity structure. Means starting up a new instance reserves more memory of the PC as needed and a download to a to smaller PLC type was possible despite of a to big project size.

New behavior
The original quantity structure is adjusted during download of any PLC type.
Means that the PLC instance using less memory on a PC if downloaded PLC is smaller than the previous biggest PLC.
A download is only possible if the project is within defined resources for that specific PLC type.

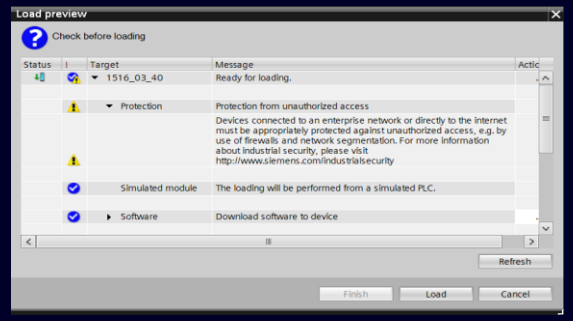
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S7-PLCSIM-Advanced V7.0
More precise simulation 2/2

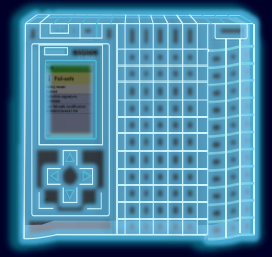
Previous behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



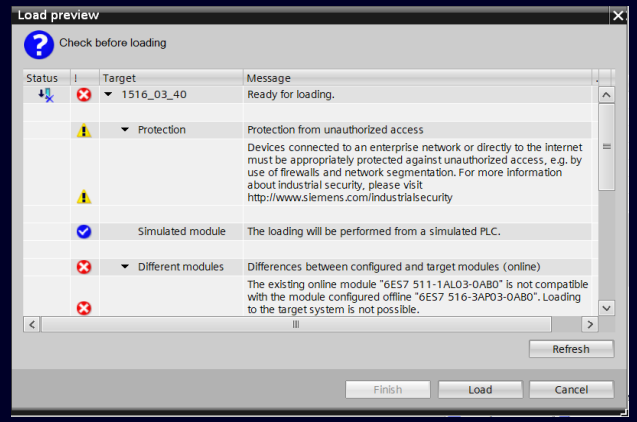
Download of incompatible PLC is **possible**
e.g. 1516 6ES7516-3AP03-0AB0



New behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



Download of incompatible PLC is **forbidden**
e.g. 1516 6ES7 516-3AP03-0AB0



Previous behavior

S7-PLCSIM Advanced always accepts the overloading of different PLC types in a long existing simulation instance in case the PLC family is the same. This is not the behavior of a real PLC and this of course can run in trouble scenarios over time.

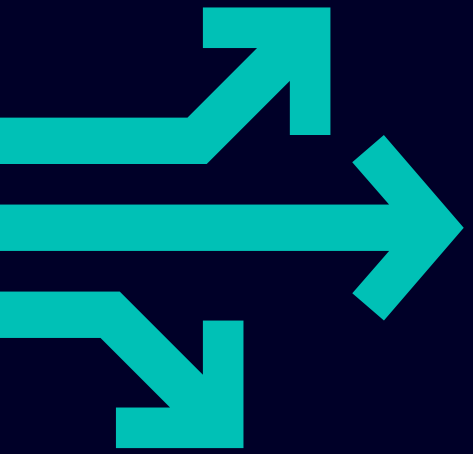
New behavior

Overloading with compatible PLC is possible but not with different PLC types anymore. The instance is after first download PLC type specific and behaves like real PLC in all download scenarios.

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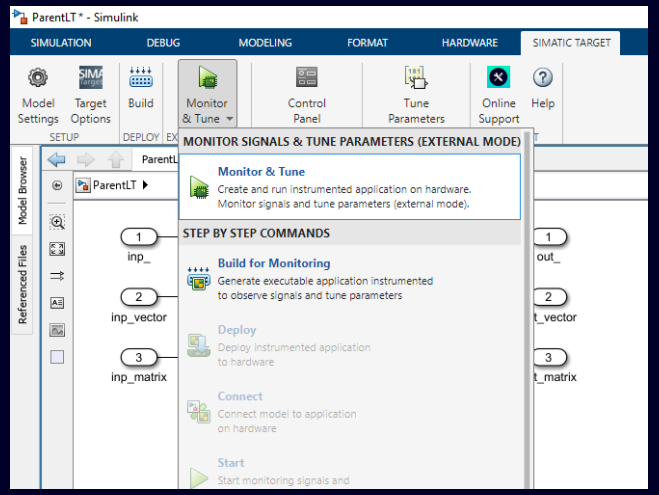
SIMATIC Target™ for Simulink® V6.0 SP2
General Improvements

Enabled by SIMULINK® MathWorks

Improvements to Simulink Target Toolstrip

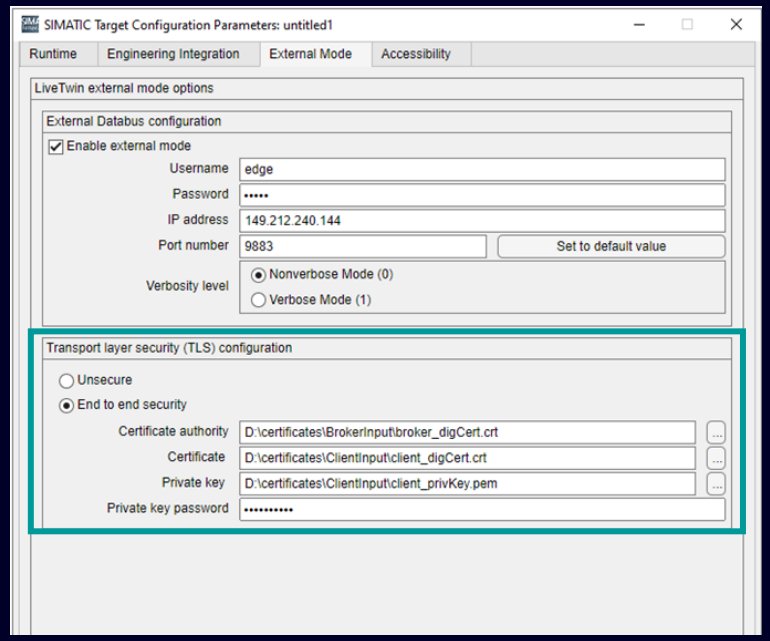
New controls in the Target Toolstrip:

- Control Panel: Navigates to External Mode Control Panel
- Tune Parameters: Navigates to Model Data Editor to inspect and edit data items like 6202 signals and parameters



Secure External Mode for LiveTwin Target

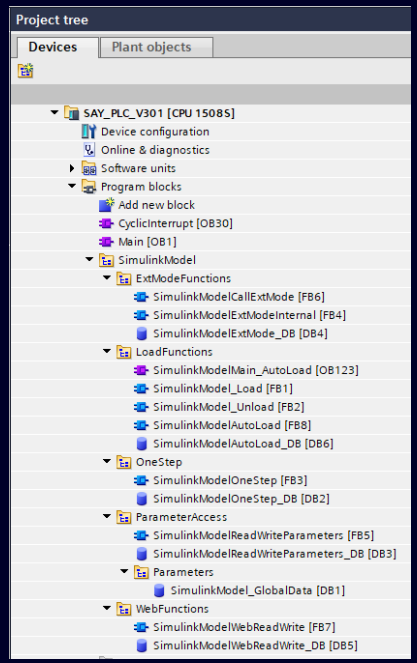
- All external mode communication between LiveTwin Runtime and Simulink is now encrypted



User group handling for generated blocks

Proper handling of user groups in the TIA Portal PLC program:

- All re-generated program blocks will be stored in their original location

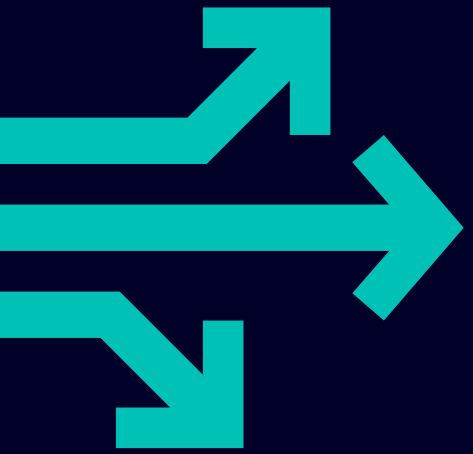


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TIA Portal V20
TIA Portal Options

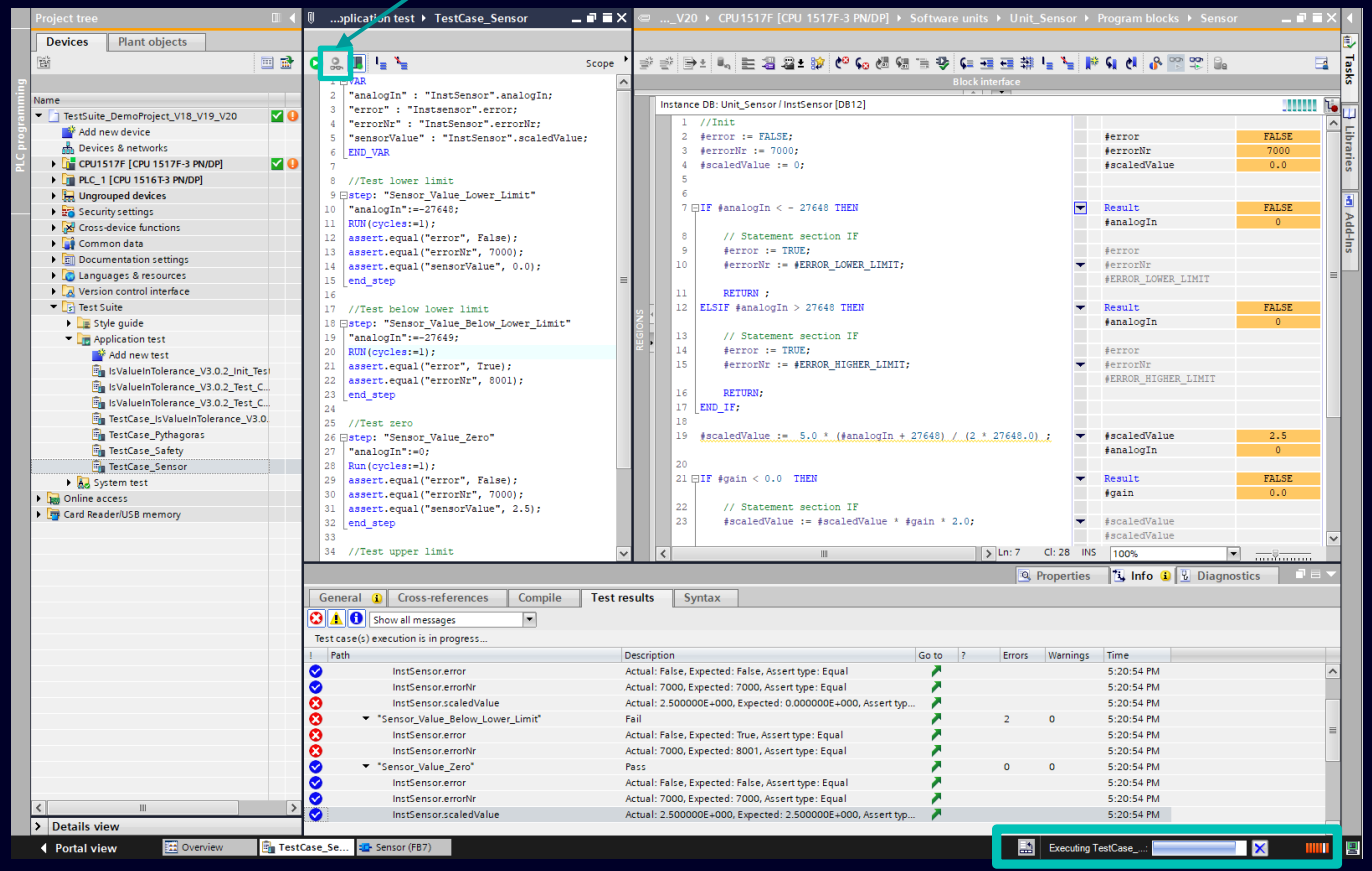
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Test Suite V20
Application Test improvements



Run test case and debug PLC program in parallel

If a test case fails, the “Execute test case in background” option helps with troubleshooting during test execution by using debugging mechanisms of TIA Portal, such as:

- Block monitoring and watch tables
- Breakpoints in SCL / STL code
- Signal traces

Benefits

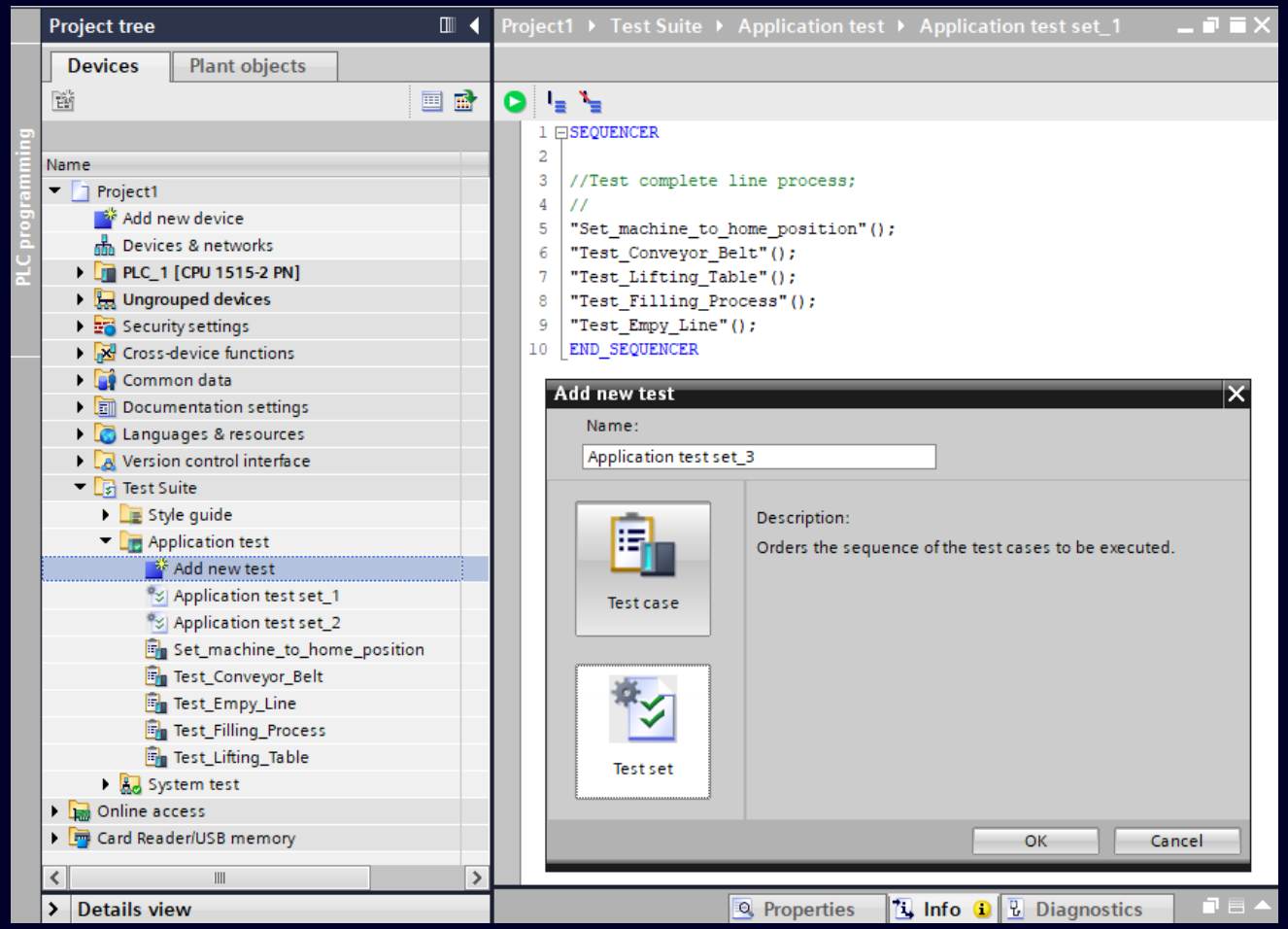
- Identifying programming errors becomes easier as the user can now monitor blocks, set breakpoints or watch trace records during test execution.
- During test execution, the user can proceed with other engineering tasks, such as e.g. HMI engineering.



S7-PLCSIM Adv.

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Test Suite V20
Application Test improvements

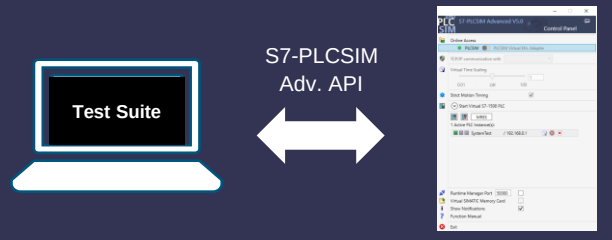


Test Set – Organize test cases

- Arrange and specify the execution sequence of test cases using the new "Test Set" concept.
- Import and export of test sets in a text format.
- Automate the execution of test sets within pipelines using the provided Openness APIs.

Benefits

- Provide quick feedback by executing only the relevant test cases.
- Minimize redundancy.
- Enhance test coverage and ensure traceability between the program and tests.
- Categorize test cases based on their relevance.



S7-PLCSIM Adv.

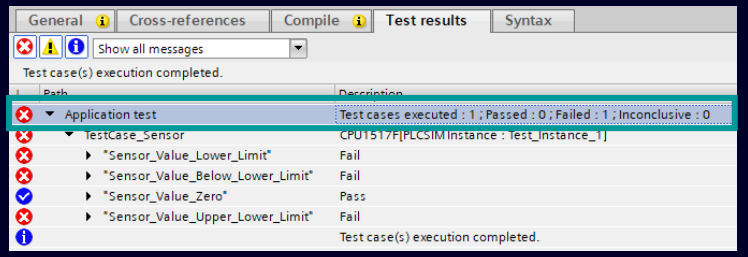
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Test Suite V20
General Improvements

Application test

- Support of SIPLUS S7-1500 PLCs
- Verification of data types **DATE , TOD , LTOD** and **LTIME** signals are supported now
- Summary of Passed/Failed/Inconclusive test cases



System test

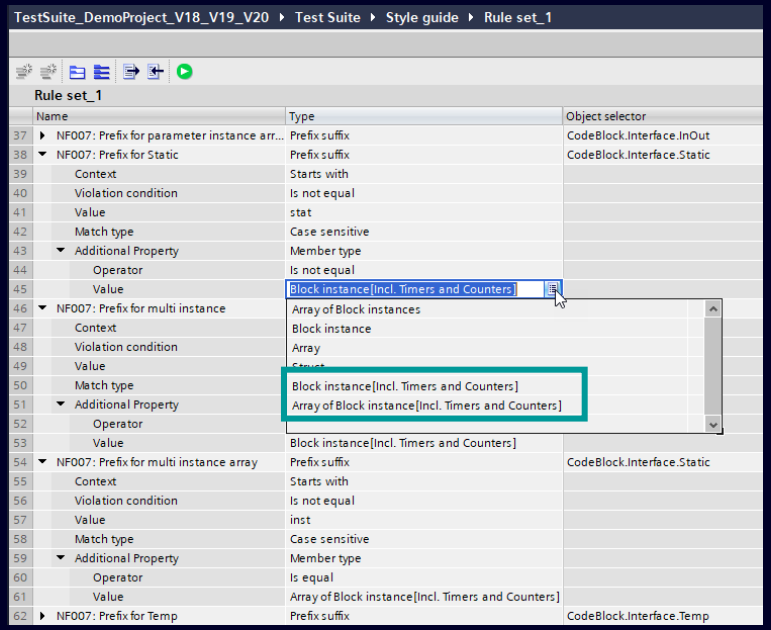
- Openness APIs to delete and rename a test cases
- Summary of Passed/Failed/Inconclusive test cases
- Optional parameter for Wait statement to specify condition (Equal or In range):
  - Supported data types : Binary numbers and Integers
  - Intuitive feedback message about test completion is based condition met or time out specified

```
STEP: "Test_Conveyor1"
//Trigger the job
"TriggerMode" := TRUE;
"ConveyorUnit1_DB"."Inputs"."Timer1_in" := TRUE;  // Perform the action
// Wait for the job to be completed
WAIT(Time := T#1s,"ConveyorUnit1_DB"."Outputs"."Conveyor1MotorStatus" = TRUE);
//Verify the action
ASSERT.Equal("Conveyor1Out",TRUE);

END_STEP
```

Style guide check

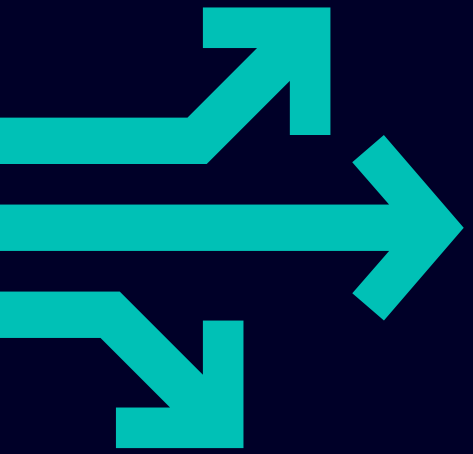
- **Timers and Counters can be considered as block instances**
  - Common rules for block instance rules inclusive Timers and Counters can be used



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TIA Portal V20
TIA Portal Options

Content



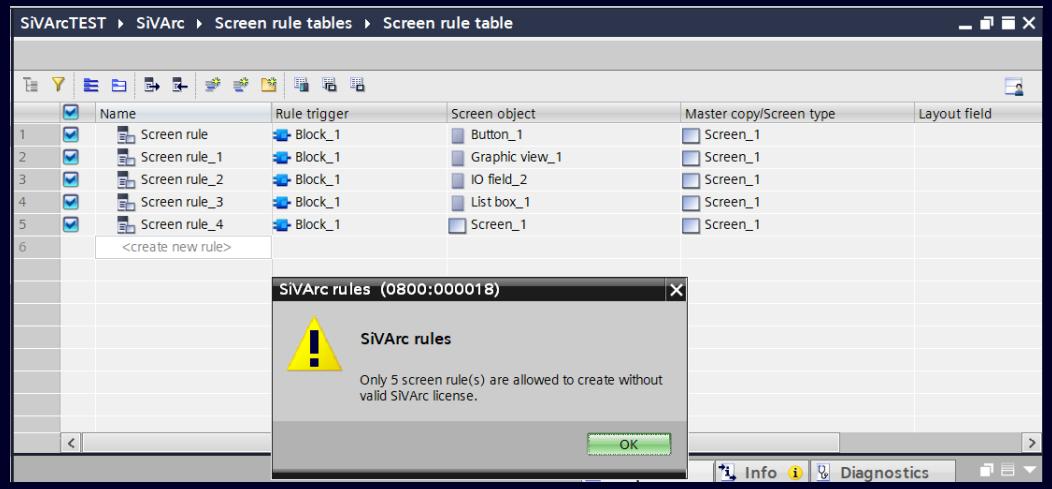
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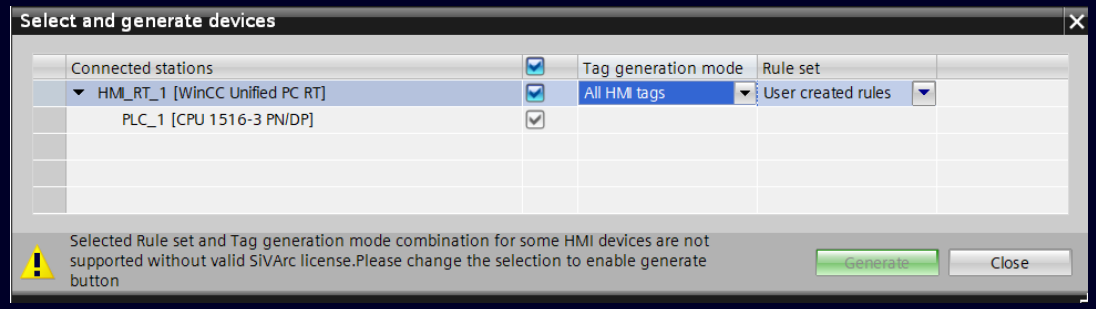
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WinCC Unified V20 - SiVArc

SiVArc with enhanced Trial mode (without license)

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Limited functionality without license

- The Trial mode is no longer limited to 21 days
- SiVArc can be used with limited number of rules without purchasing a license:

Rule table	Maximum Number of rules configurable
Screen rule table	5
Text list rule table	3
Alarm rule table	1
Tag rule table	1
Advanced tag rule table	Not allowed in Trial mode
Copy rule table	Not allowed in Trial mode

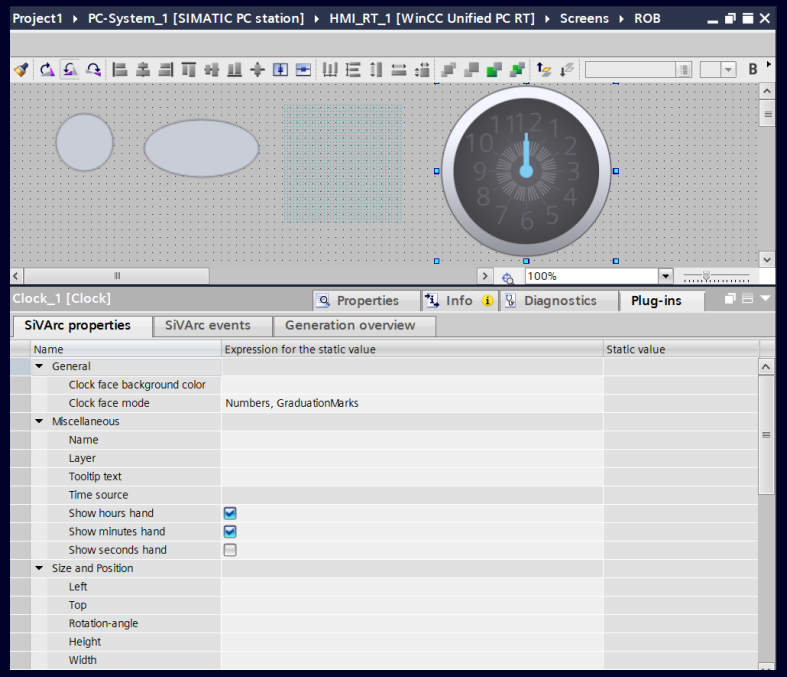
- Generate function will be enabled for supported mode & rule set
- Corresponding warning is provided, if mode and rule requirements are not met

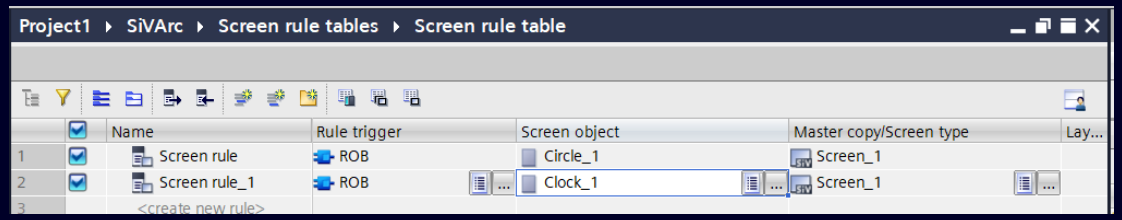
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WinCC Unified V20 - SiVArc

SiVArc supported all standard Unified Screen Objects

Panel ✗	RT Advanced ✗	RT Professional ✗
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Following additional screen Objects can be generated via SiVArc on Unified HMIs

Basic Objects:

- Circle, Ellipse, Line, Polyline, Polygon, Circular arc, Elliptical arc, Circle Segment & Ellipse Segment

Elements

- Check box, Radio button, List box, Touch area & Clock

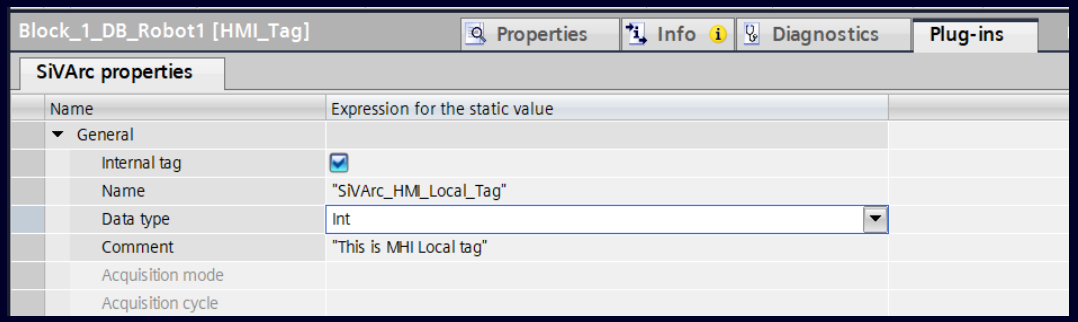
Controls

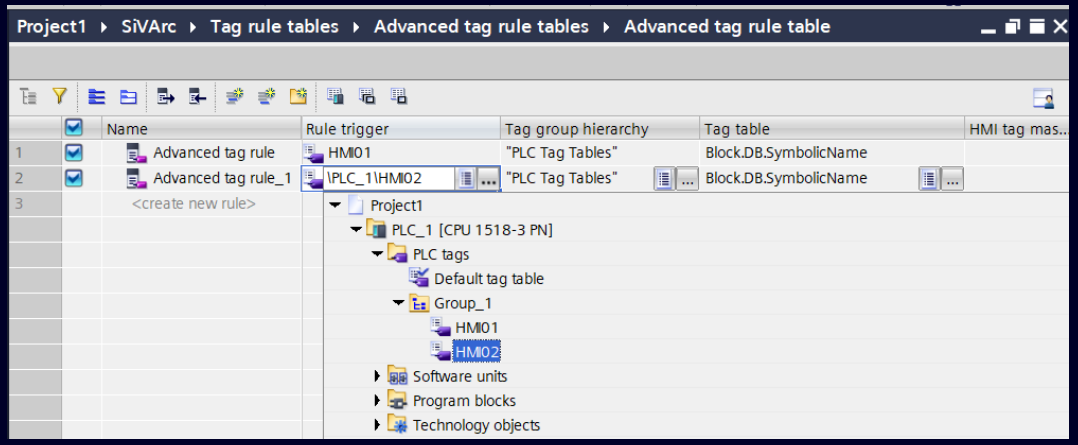
- Screen window, Faceplate container, Trend companion, Alarm control, Parameter set control, System diagnostic control, Criteria analysis control Web control & Media player

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WinCC Unified V20 - SiVArc
Advanced tag rule enhancements

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





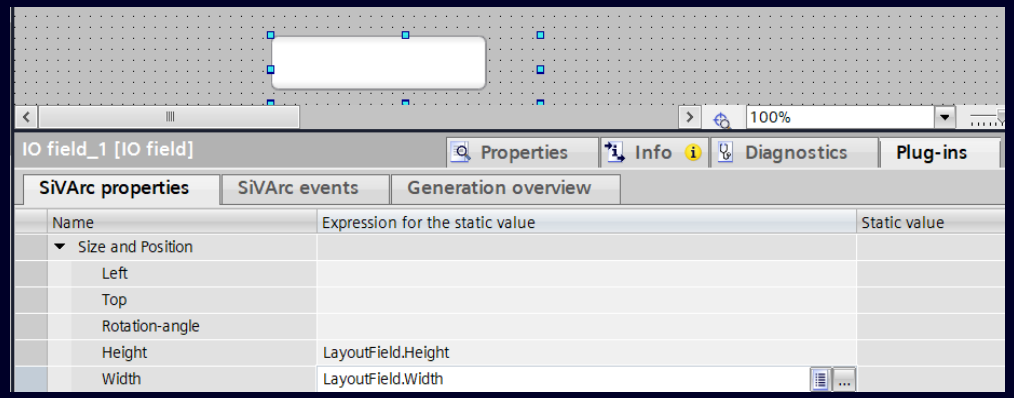
Advanced tag rule-based generation supports following

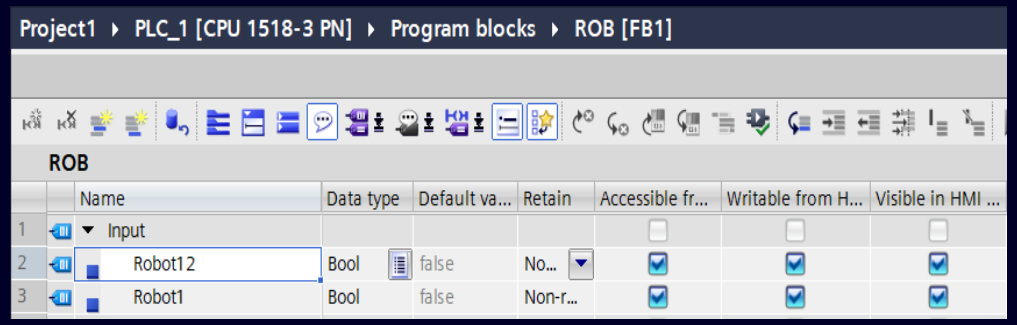
- Acquisition cycle & Acquisition mode properties can be set via tag template
- HMI internal (Local) tags can be generated via advanced tag rules
- User can generate only used tags on target HMI devices
- HMI tags based on PLC Tag tables can be generated

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SIMATIC Visualization Architect V20
New SiVArc expressions

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





New SiVArc expressions

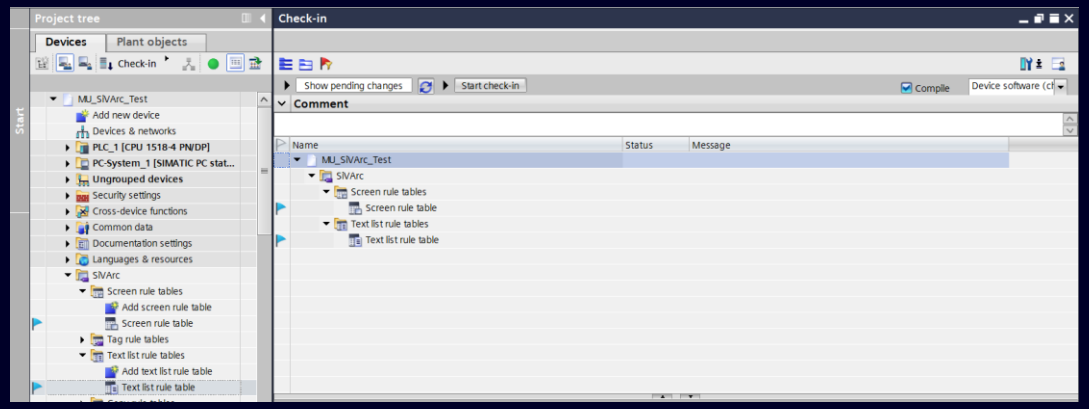
- The expressions “LayoutField.Width” and “LayoutField.Height” can be used to generate image objects based on the size of the layout fields
- With the following expressions, the user can read the PLC variable columns “Accessible…”, “Visible…” and “Writable…”:
  - S7Variable.HmiAccessible
  - S7Variable.HmiWritable
  - S7Variable.HmiVisible

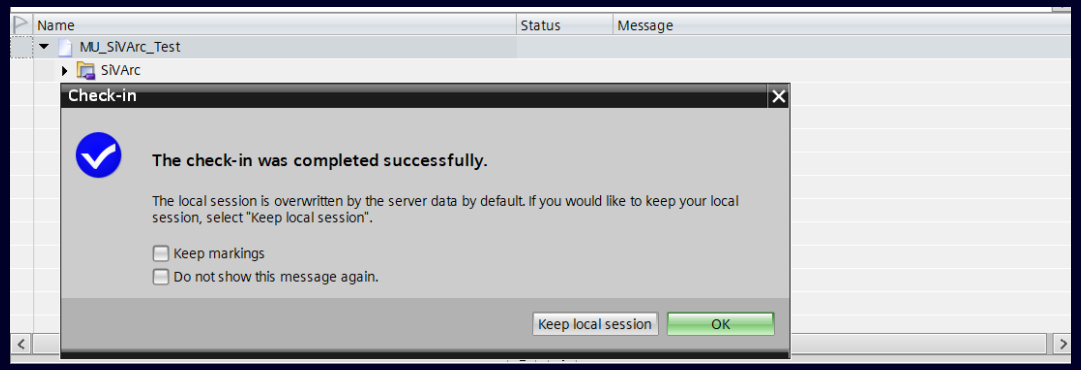
e.g.: To control the generation of the HMI variables via the Visible setting in HMI engineering

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WinCC Unified V20 - SiVArc
Multi user engineering support

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





SiVArc rule tables as multiuser objects

- SiVArc rule tables can be used in Multiuser Engineering, there by significantly reducing the configuration time

The rule tables supported are:

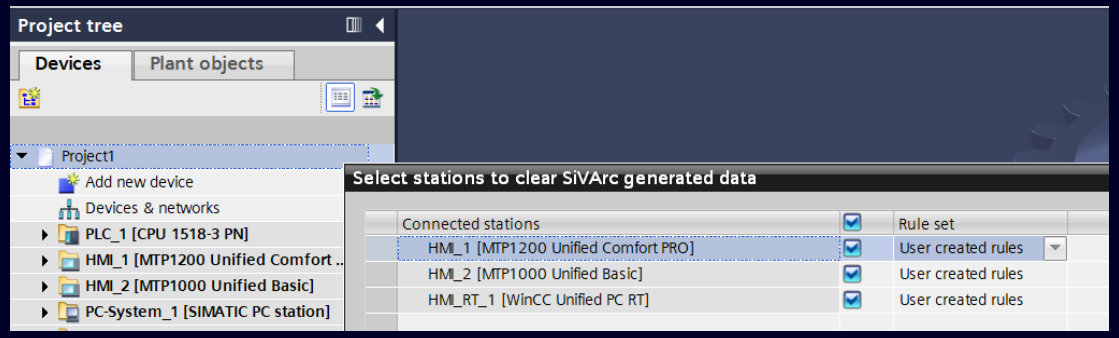
- Screen rule table
- Tag rule table
- Alarm rule table
- Text list rule table
- Copy rule table
- Expression tale

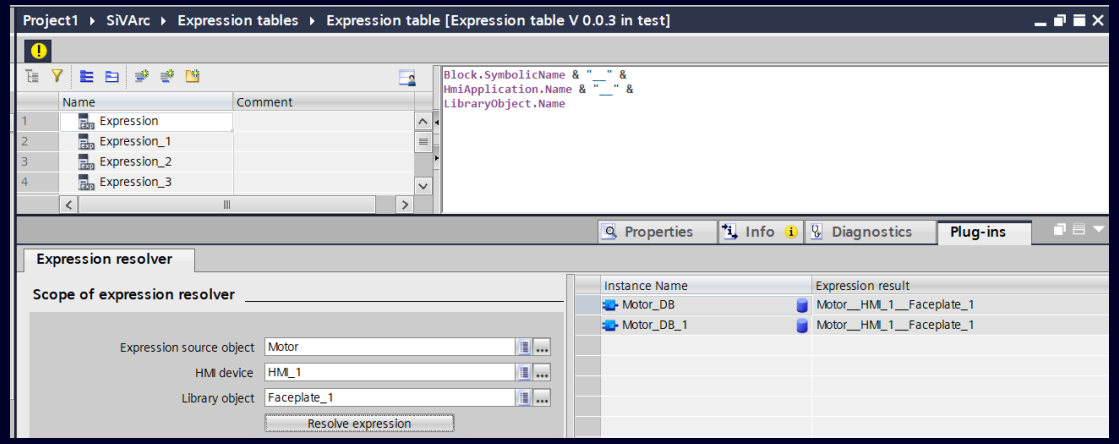
- On inconsistency respective messages are displayed to user

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WinCC Unified V20 - SiVArc
Usability improvements

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





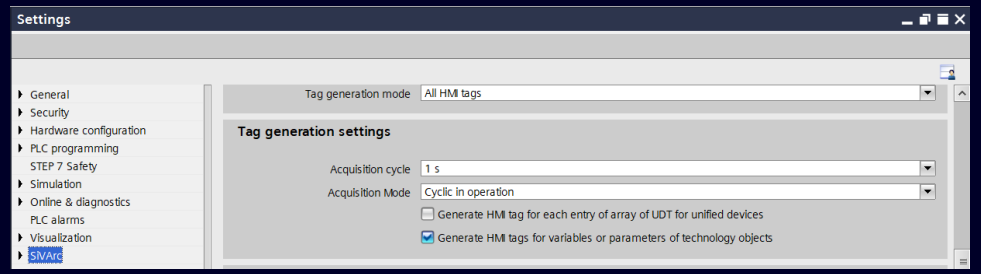
Improvements in usability

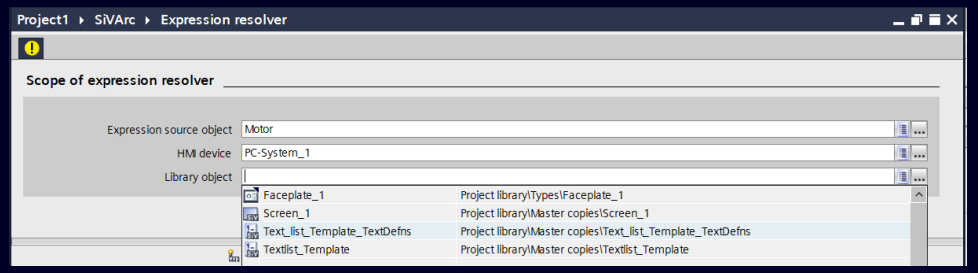
- Clearing the generation data for multiple devices is possible
- Troubleshooting SiVArc expressions is possible at expression tables
- Layout screens are automatically generated from user configured screens, reducing the effort for manual engineering
- SiVArc log is enhanced to display HMI tags by name

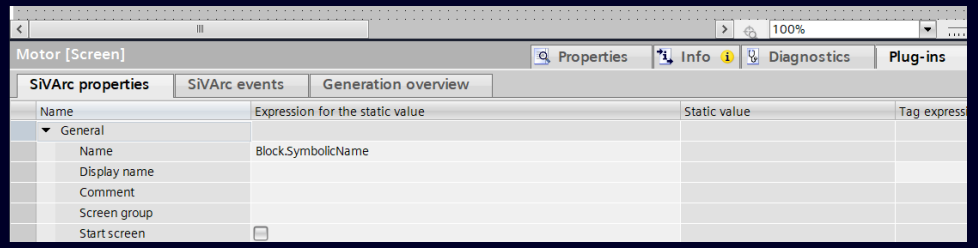
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WinCC Unified V20 - SiVArc
General improvements

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓







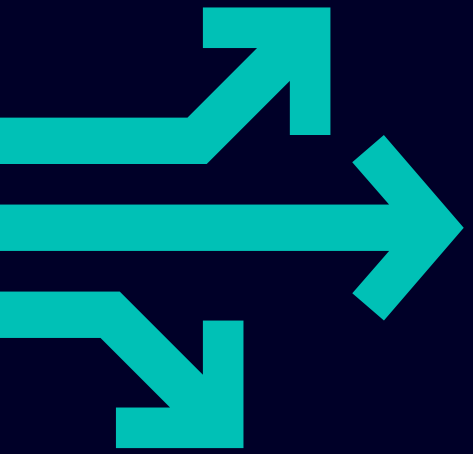
General improvements

- User can decide to generate HMI tags for variables or parameters of technology objects via Project setting
- Expression resolver additionally supports Program block/block instance, HMI device, Library object as source object
- Configuring the Start screen in Runtime settings via SiVArc generation
- Generation support of alarm logs via copy rules and alarm rules

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TIA Portal V20
TIA Portal Options

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MTP as driver for **flexible production** and **package unit integration**
Core concepts: Standardized interfaces and application-level description

Module Type Package (MTP)

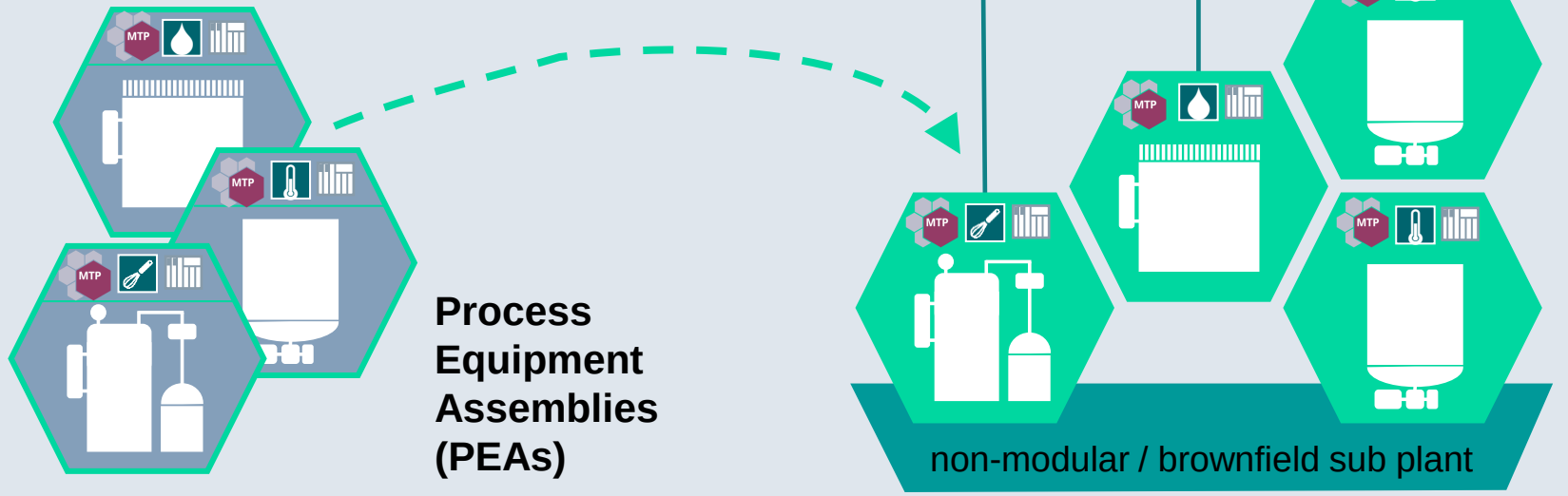
MTP is a standardized, non-proprietary, application-level description of autonomous equipment assemblies



hosted by: PI PROFIBUS • PROFINET

Based on: OPC UA

Flexible, modular plants are built out of intelligent, autonomous **Process Equipment Assemblies (PEAs)** with **standardized[1)] interfaces** described in **Module Type Package (MTP)**



[1)] MTP standard 2658 hosted by PI

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Modular Automation is a cross-industry trend:
with our existing MTP-portfolio we can actively address the market!


Chemicals


Pharma


F&B

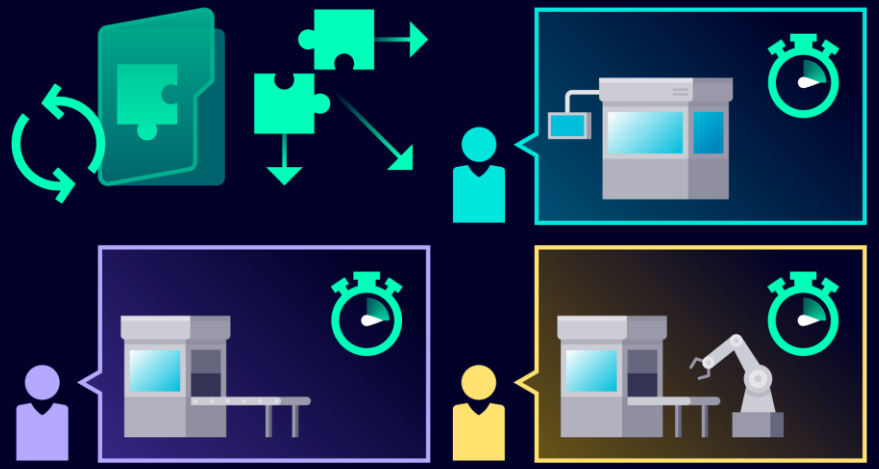

Batteries


Hydrogen


Marine


W&WW


Intralogistics



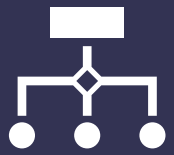
No reprogramming or new installation, just plug & produce

We enable our customers to implement MTP based on our standard portfolio (PLCs, HMIs, TIA Portal, …):

- Benefit for OEMs:
  Completion of our portfolio to enable the delivery of MTP-compliant module / process equipment



- Benefit for End customers & System Integrators:
  Completion of our HMI and SCADA portfolio to monitor and control modular plants (Process Orchestration)



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TIA Portal - MTP Portfolio
Modular automation

End customer & System Integrators
Process Orchestration Layer (POL)

PEA Orchestration

SCADA
Supervisory Control and Data Acquisition

WinCC Unified
SIMATIC MTP Integrator for WinCC Unified



OPC UA

OPC UA

OEM
Process Equipment Assembly (PEA)



MTP

SIMATIC MTP Creator

TIA Portal libraries:
Control Function Library (CFL)
Process Function Library (PFL)
OEM's Libraries

OR

MTP

Machine Proxy

SIMATIC S7

Option 1: MTP based on SIMATIC PLC and HMI

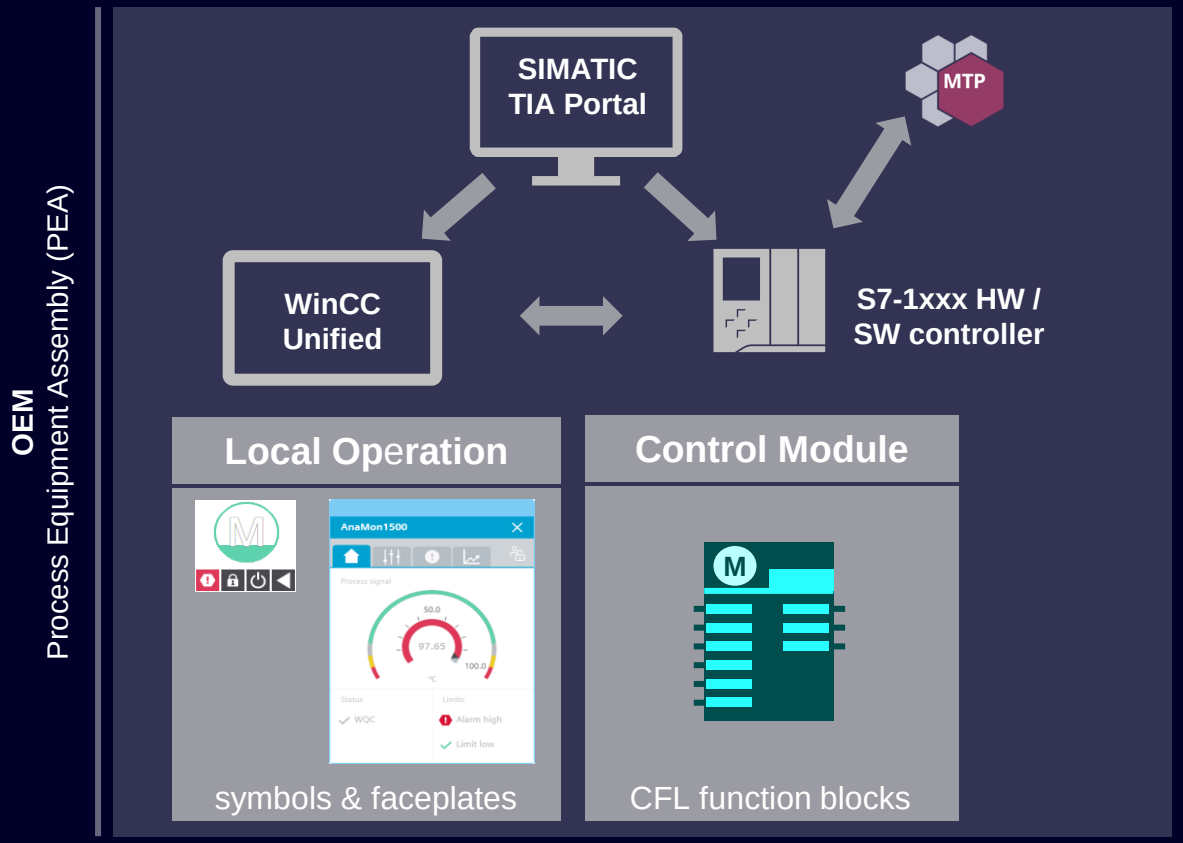
Option 2: MTP based on Edge for brownfield

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TIA Portal - Engineering Efficiency for Modules
Modular automation – SIMATIC Control Function Library (CFL)

Unified Basic Panel ✗ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Standardized module engineering with a modular and memory optimized library, offering:

- TIA Portal Step 7 (S7-1xxx HW / SW controller) and WinCC Unified Objects with optimized footprint & performance, (Industry-specific blocks like Aggr8, TimeSwitch, SetCrv, …)
- State of the art TIA Portal Engineering based on PLCOpen
- Supports virtual commissioning based on PLCSIM Advanced and SIMIT with ready to use templates tailored to CFL

Standardized Operation

- Faceplates aligned to WinCC Unified Look & Feel (HMI Design based on HMI Template Suite)
- Corporate Design via SIMATIC WinCC Unified Corporate Designer / TIA Portal

CFL can be used in MTP and Non-MTP Use Cases

Latest Version on : Simatic MTP SIOS Landing Page

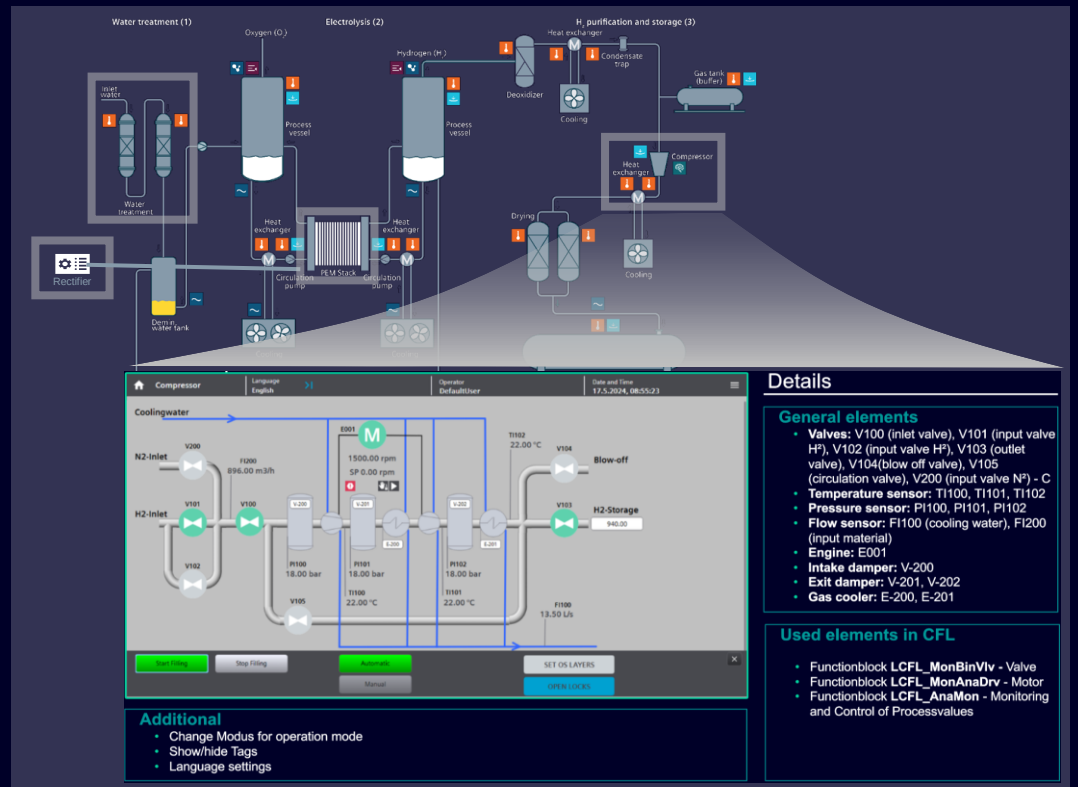
Module Type Package (MTP)

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TIA Portal - Engineering Efficiency for Modules
Modular automation – SIMATIC Control Function Library (CFL)

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓

OEM
Process Equipment Assembly (PEA)



Hydrogen TIA Portal Application Examples based on CFL

CFL - Industry-specific blocks

Optimized footprint & performance for S7-1xxx HW / SW controller & WinCC Unified

Drives
- MonBinDrv FP
- MonAnaDrv FP
- MonBinVlv FP
- MonAnaVlv FP

Monitor
- AnaMon FP
- BinMon FP
- DIntMon FP
- StringView FP

Operate
- AnaManInt FP
- BinManInt FP
- DIntManInt FP

Interlock
- LockView4 FP
- LockView8 FP

Common Blocks
- Maintenance FP
- DriveInterconnector

Control
- PIDCtrl FP
- Aggr8 FP
- TimeSwitch8 FP
- SetCrv FP
- Polygon FP

New

MTP Service Framework FP
- Service
- Procedure
- Config Parameter
- Procedure Parameter

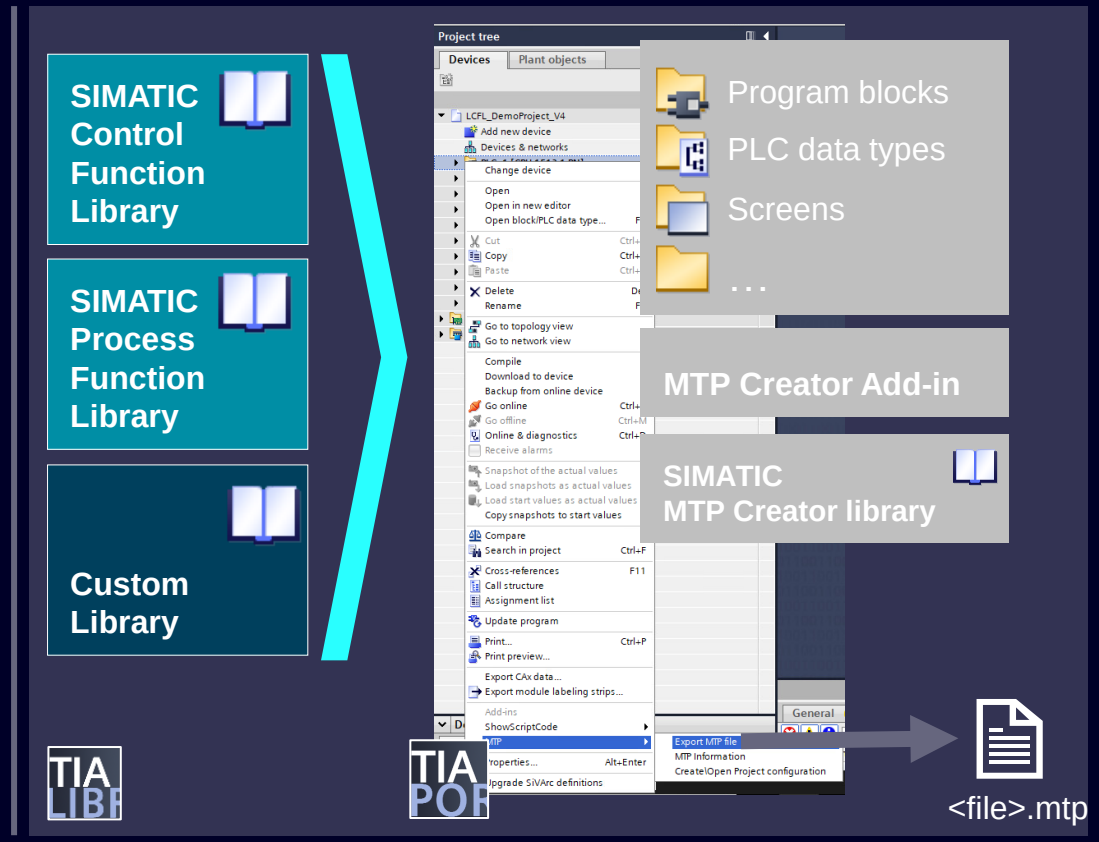
Latest Version on : Simatic MTP SIOS Landing Page

Module Type Package (MTP)

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TIA Portal goes MTP - Engineering Efficiency for Modules
Modular automation – SIMATIC MTP Creator



SIMATIC MTP Creator for exporting an MTP-conform file from an existing TIA project, by only one-click!

- The MTP file contains MTP relevant Contents like control modules, services, OPC UA configuration and the pictures based on the STEP 7 (TIA Portal) and WinCC Unified engineering.
- Supports VDI/VDE/NAMUR 2658 Part 1 / 2 / 3 / 4
- Supports SIMATIC Process Function Library (PFL), SIMATIC Control Function Library (CFL) and Customer Libraries

New

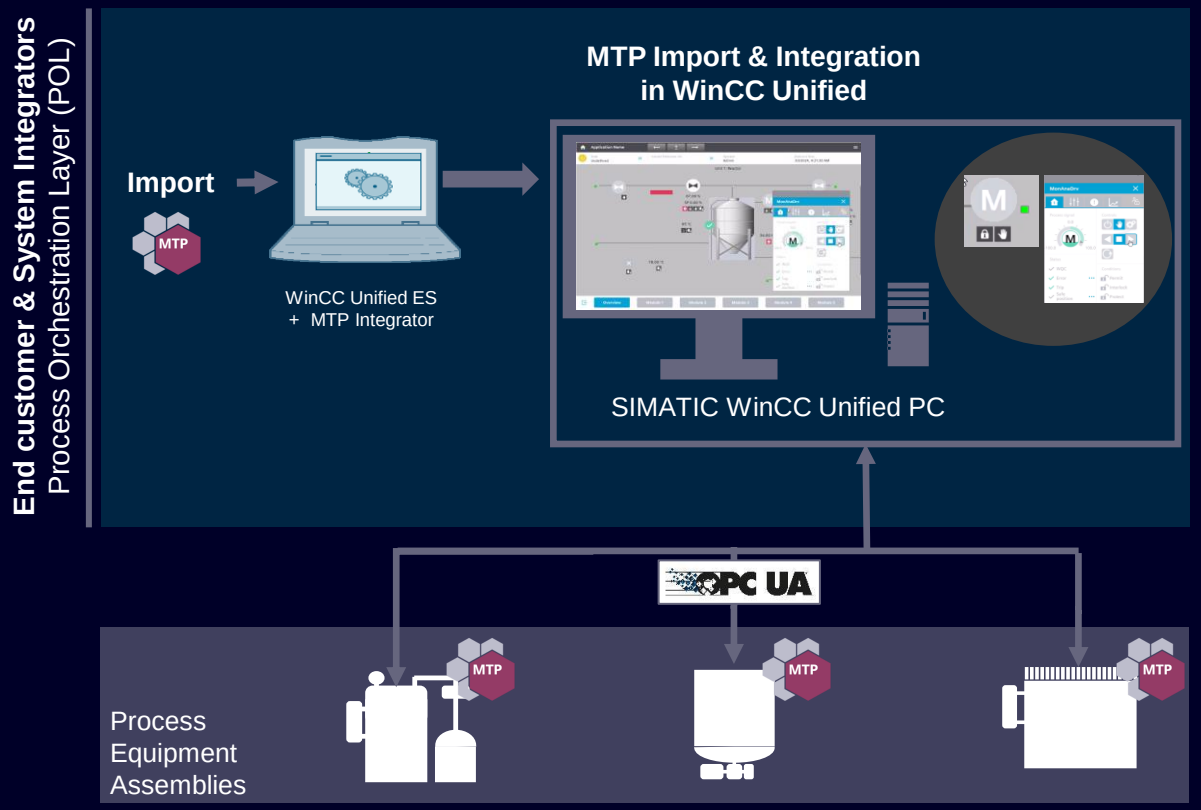
Latest Version on : Simatic MTP SIOS Landing Page

Module Type Package (MTP)

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TIA Portal - Process Orchestration
Modular automation - MTP Integrator for WinCC Unified

Unified Basic Panel ✗ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Integrate standardized MTP package units / machines in WinCC Unified, including PLC and HMI components

- Standardized, line operation of package units / machines

Use MTP files (Siemens or 3rd party) to integrate (cross- vendor) machines automatically

- By instantiating the machine type within your project, the OPC UA connections, PLC tags and HMI components are created with just one click.

Controlling complete units / machines in an abstract way

- Operators can focus on the production without needing to understand details of each multi-vendor machine.
- Maximized operational efficiency, reduced training effort and consistency regarding operation, even if new modules are added modified due to changing market demands.

No. of Package Units / Machines : Unified PC RT: 10 // Unified Comfort Panel: 3

Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

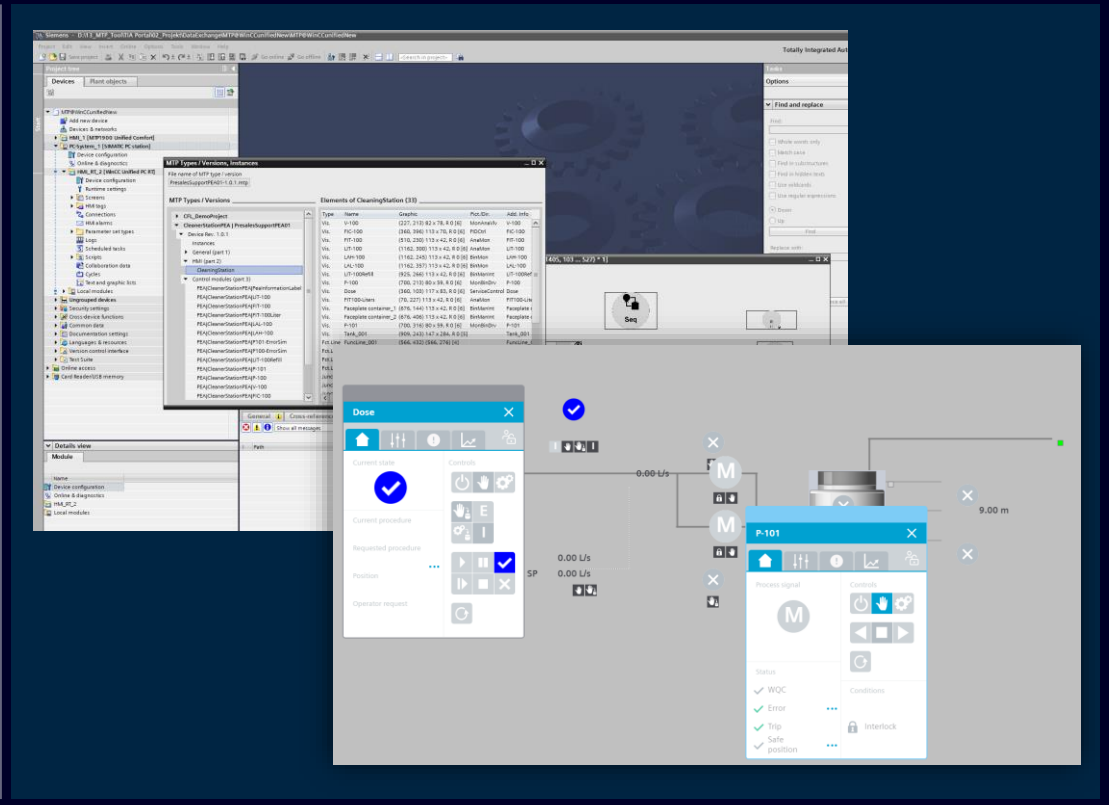
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TIA Portal - Process Orchestration

Reduce engineering effort by -70% [1] and Increase flexibility by +80% [1]

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓

End customer & System Integrators
Process Orchestration Layer (POL)



- MTP Import in WinCC Unified Engineering [2]
- Type management incl. full versioning for your MTP files
- PEA instance management
- Static and dynamic HMI Integration (MTP Part 2 + 3)
- Monitoring and control via Faceplate (block icons and detailed views) Orchestration of plantwide HMI (part 3)
- Manual operation of MTP Services via HMI (part 4) — New
- MTP Multilanguage Support — New
- Native OPC UA communication with configurable levels of security mechanisms (draft part 5/5.1) [3]
- POL-based alarms (draft part 6/7) [3]

[1] Source: ZVEI, 2022
[2] Implementation compliant to the noted parts of the MTP Specification (VDI/VDE/NAMUR 2658)
[3] Concepts for runtime interoperability (part 5/5.1) and alarming (part 6/7) are not fully specified, yet

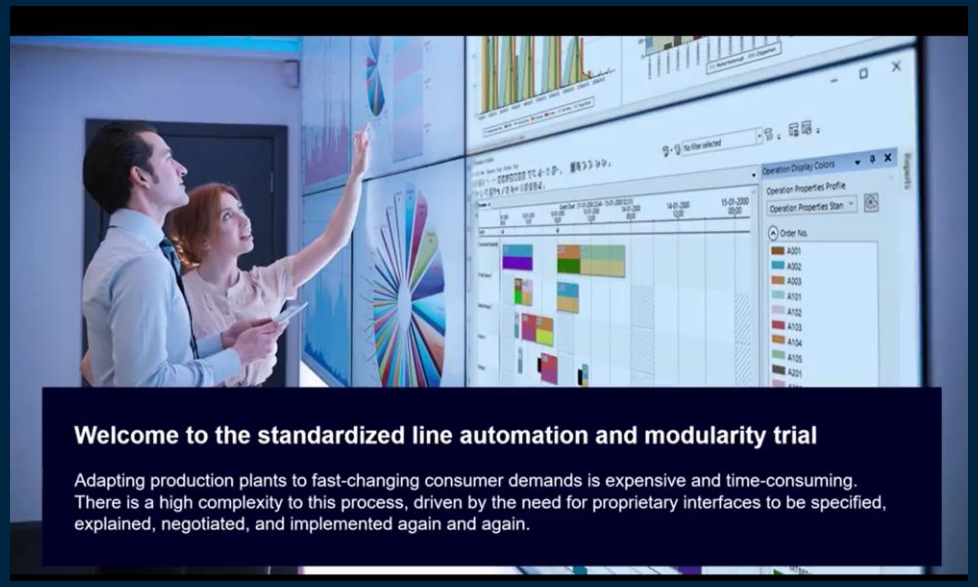
Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

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TIA Portal - Process Orchestration
SIMATIC MTP Integrator for WinCC Unified Trial – Simply try it out

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓

End customer & System Integrators
Process Orchestration Layer (POL)



MTP trial – Simply try it out

Try our 30-day rapid line automation engineering with MTP trial.
No installation is required. Start exploring in minutes.
(Chrome/Firefox/Edge/Safari recommended)

Easily adapt production lines to fast-changing consumer demands with a module based standardized approach

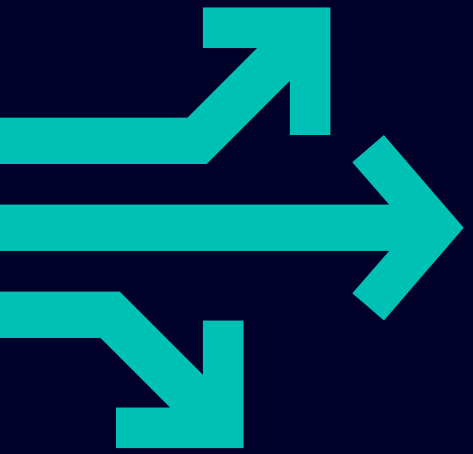
- Adding new equipment or modifying an existing and running production line is typically complex, time consuming and risky
- Cell or line visualization required for better overview and central operation needs, if manually engineered, consumes substantial time and effort and is error prone
- With the standardized Module Type Package (MTP) approach, you can reduce risk, engineering effort and downtime, as well as shorten the time to easily integrate new equipment into an existing production line
- MTP is a widely standardized and market-proven technology that can be purchased off-the-shelf

Module Type Package (MTP)

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TIA Portal Options

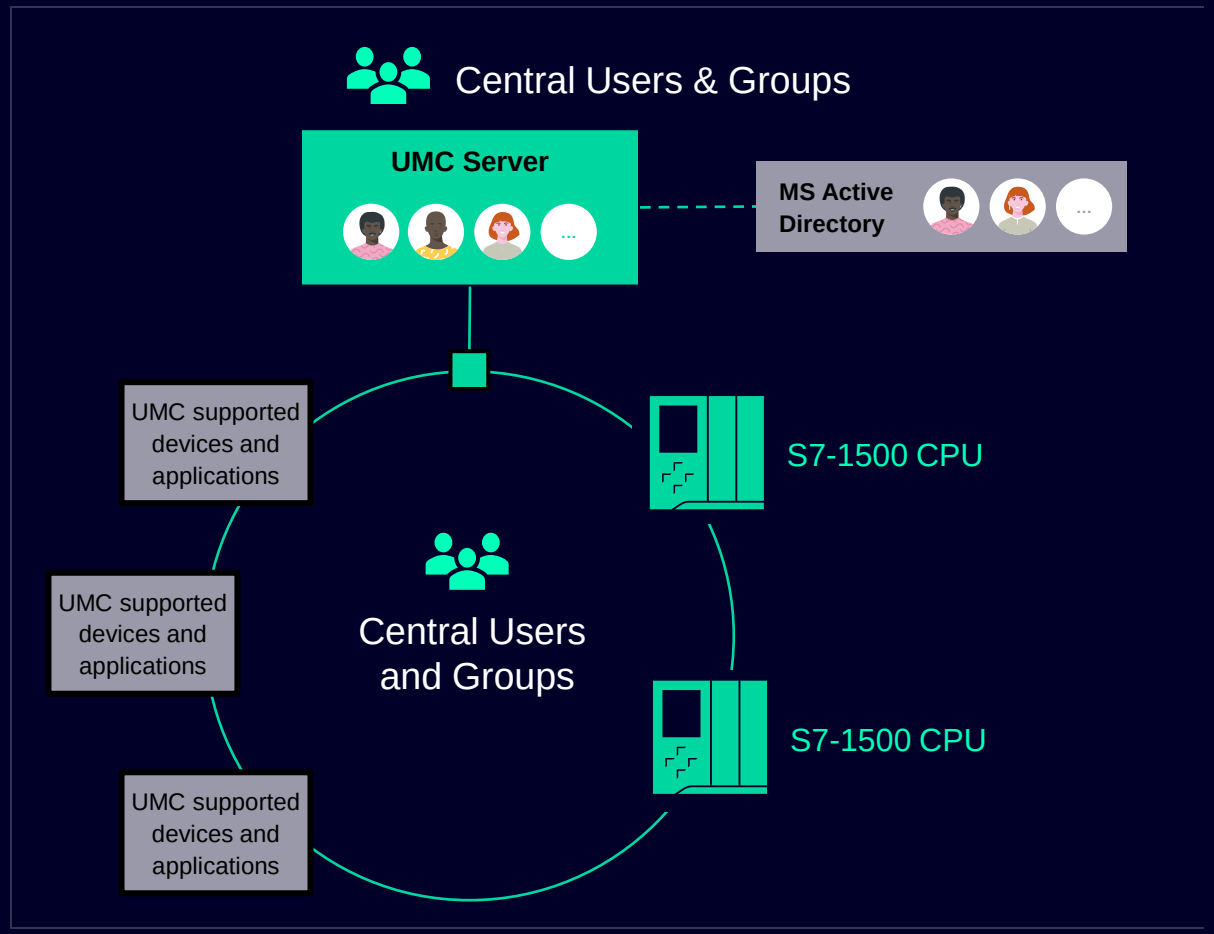
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Central User Management (UMC)
Support of SIMATIC S7-1500 CPU for Central User Management



SIMATIC S7-1500 UMAC can connect to UMC to use centrally managed users and groups

- CPU services can now be used by centrally managed users and user groups from UMC and a connected Microsoft Active Directory.
- The central user data can be changed directly in the central user administration or the MS Active Directory without changes to the CPU configuration.

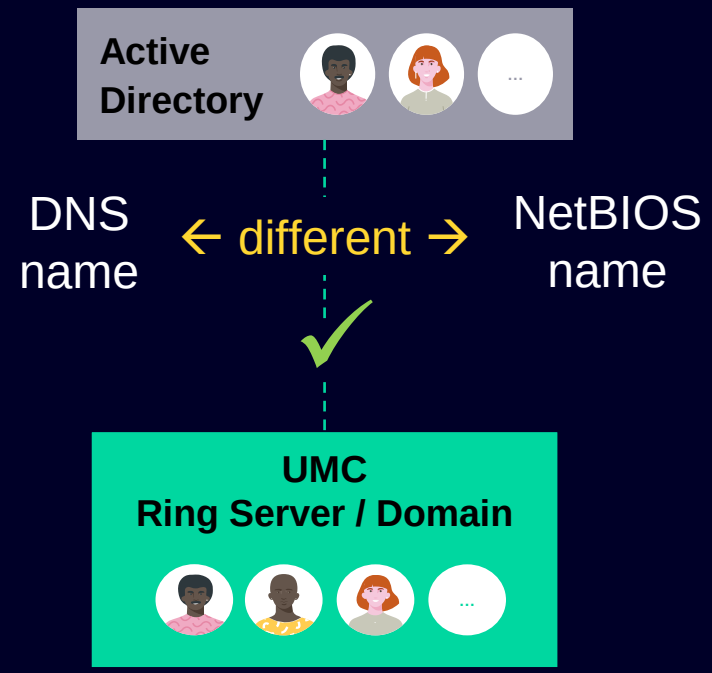
Benefit

- Central user management is available for a growing supported product portfolio, allowing an efficient user management
- Further supported products are:

  TIA Portal Engineering | WinCC Unified RT | WinCC Advanced RT | SINEMA RC | SINEC NMS | SINEC INS, SIMATIC PCS neo | OpCenter Execution

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Central User Management (UMC)
Support for MS Active Directory configurations with different FQDN and NetBIOS name



Support of unconventional AD configuration

- UMC now supports Active Directory configurations that deviate from Microsoft recommendations but are frequently used by customers.
- UMC can now connect to Active Directory even if the DNS and NetBIOS names are different.

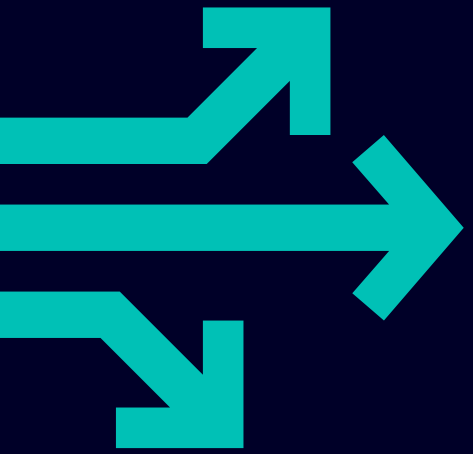
Benefit

- This enables a better integration of UMC into existing customer infrastructures and a more flexible deployment.

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Content

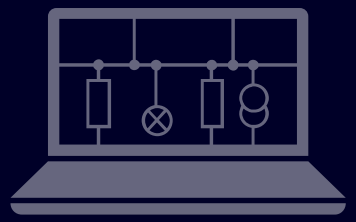


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Modular Application Creator – Generating instead of programming

HW Config in TIA Portal



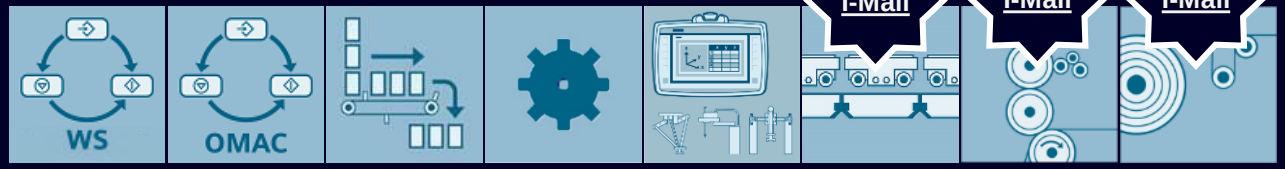
ECAD/HWCN

Modular Application Creator 19.1 Update!



- Generating instead of programming TIA Portal projects
- Easy configuration with technological view and graphical guided assistance as well as automatic validation
- Management of projects and versioned/signed equipment modules

Equipment Modules



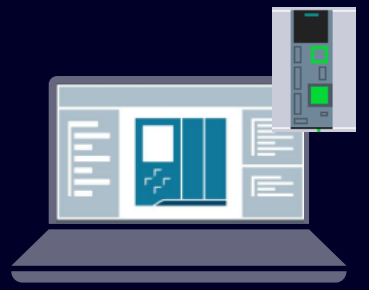
Weihen-stephan | OMAC | Intel. Belt | TO Gen. | Robotics | MCS Update! | Printing | Converting Update!

Module Builder



Visual Studio Extension to create your own **custom modules**

Generation of the TIA Portal project incl. drives:



TIA Portal project

SIMIT **HMI (Openness)**

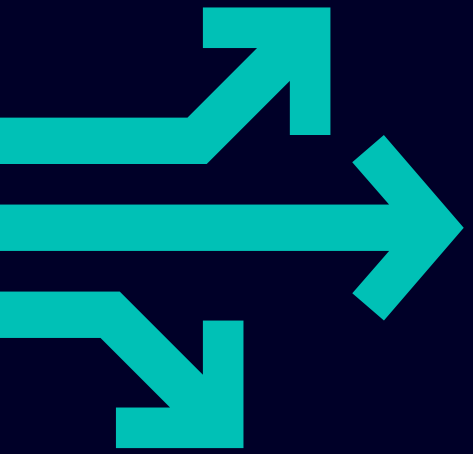




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ProDiag
Customer Benefits: Key questions to make decisions

> You are faced with the task of adapting your process diagnostics very often and do not want to change your library function blocks every time?

> You want to cycles granularly record all process errors in order to identify causalities?

> You want to reliably identify sporadic errors and display them on the HMI?

> You want to handle your supervisions centrally in a separate view, independent of your user program?



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ProDiag
Availability

+ SIMTIC S7-1500 family



+ SIMATIC HMI WinCC Unified/Unified Comfort Panels

WinCC Adv.



+ SIMATIC HMI WinCC Advanced/Comfort Panels

WinCC Adv.



+ SIMATIC HMI WinCC Professional/WinCC Scada (V.8 or higher)

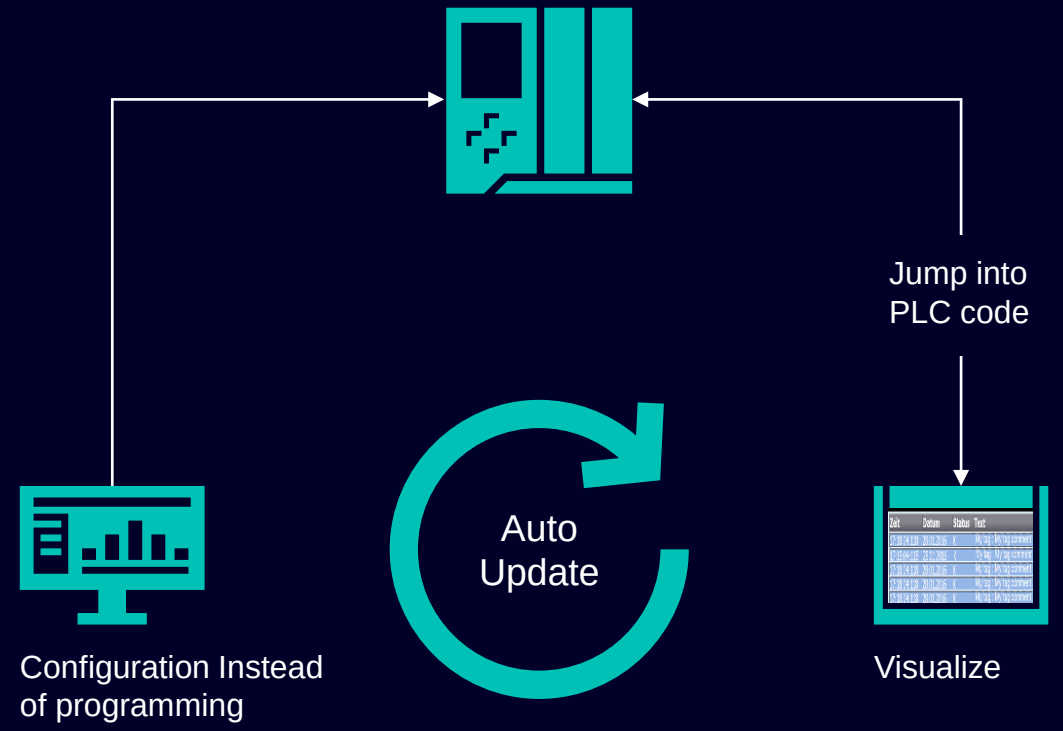


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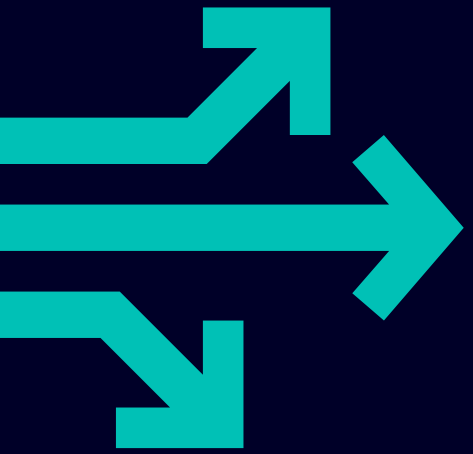
System advantage: Automatic Update of the HMI during runtime

- PLC is available as a central alarm server for 3 languages
- System ensure the data consistency
- No consideration of different engineering steps required
  → Download to PLC → ready
- Easy maintenance
  → No specialist staff for HMI required
- Changing alarms during operation



TIA Portal V20
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04	SIMATIC Robot Library
05	OPC UA
06	SIMATIC S7-PLCSIM / S7-PLCSIM Advanced
07	SIMATIC Target for Simulink
08	TIA Portal Test Suite
09	SIMATIC Visualization Architect (SiVArc)
10	SIMATIC Modular Automation (MTP)
11	Central User Management (UMC)
12	Modular Application Creator
13	SIMATIC ProDiag / SysDiag
14	TIA Portal Teamcenter Gateway
15	TIA Package Manager
16	TIA Portal Safety Validation Assistant

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TIA Portal Teamcenter Gateway

Teamcenter Version support

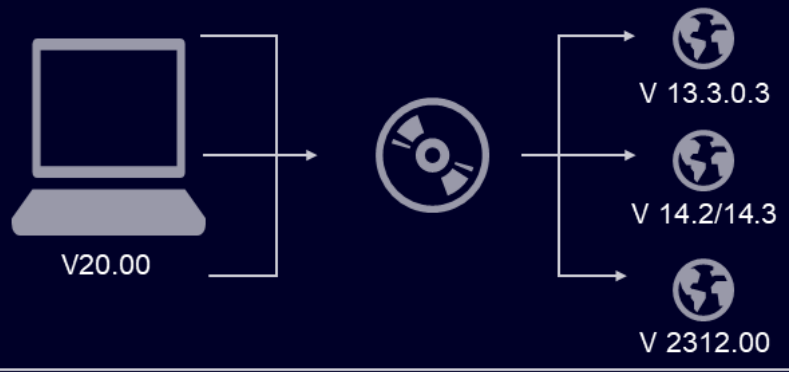
Support

TIA Teamcenter Gateway provides different version of Teamcenter support (i.e. 13.3.0.3, 14.2, 14.3 and 2312.00) in TIA Poral V20.

Benefits

- Digital Enterprise requires a connection of TIA Portal and Teamcenter
- Existing customers can use different version of TIA Portal and Teamcenter
- Managing various TIA Portal engineering project also part of PLM system

	TIA Portal Version
Teamcenter (Server + Client)	V20.00
13.3.0.3	X
14.2	X
14.3	X
2312.0	X

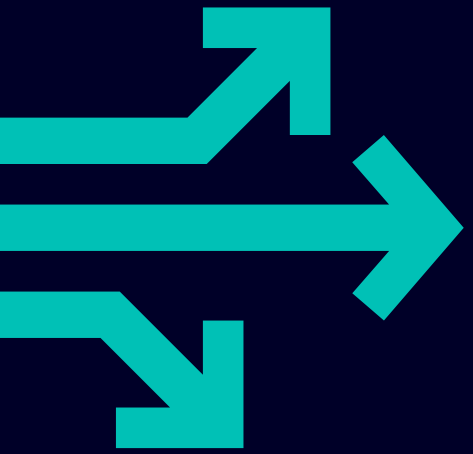


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TIA Portal V20
TIA Portal Options

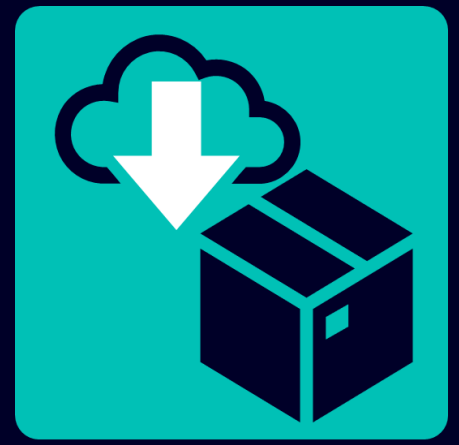
Content



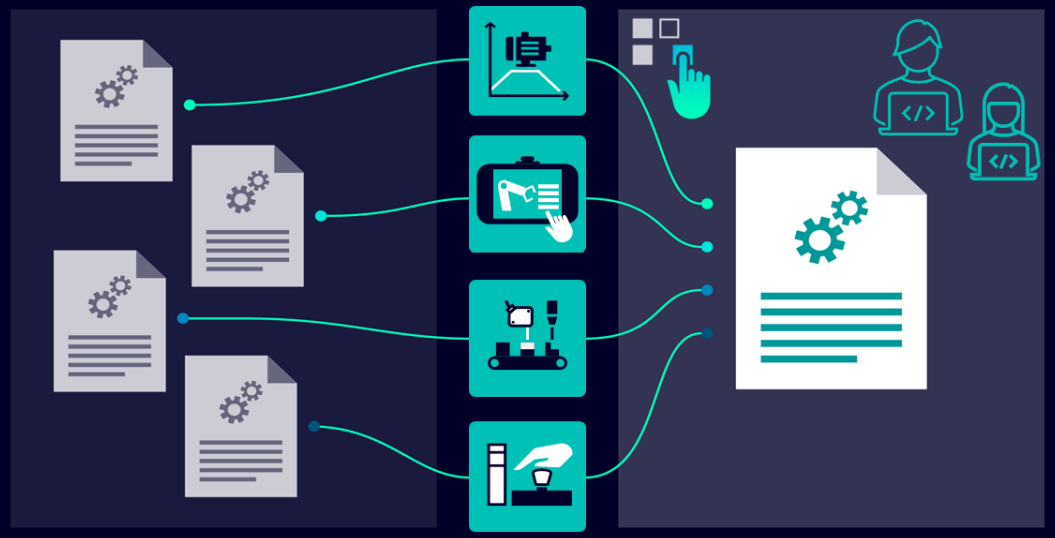
01	SIMATIC STEP 7 Safety
02	SIMATIC Safe Kinematics
03	TIA Portal Multiuser
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TIA Package Manager



Download libraries and application examples
with one click

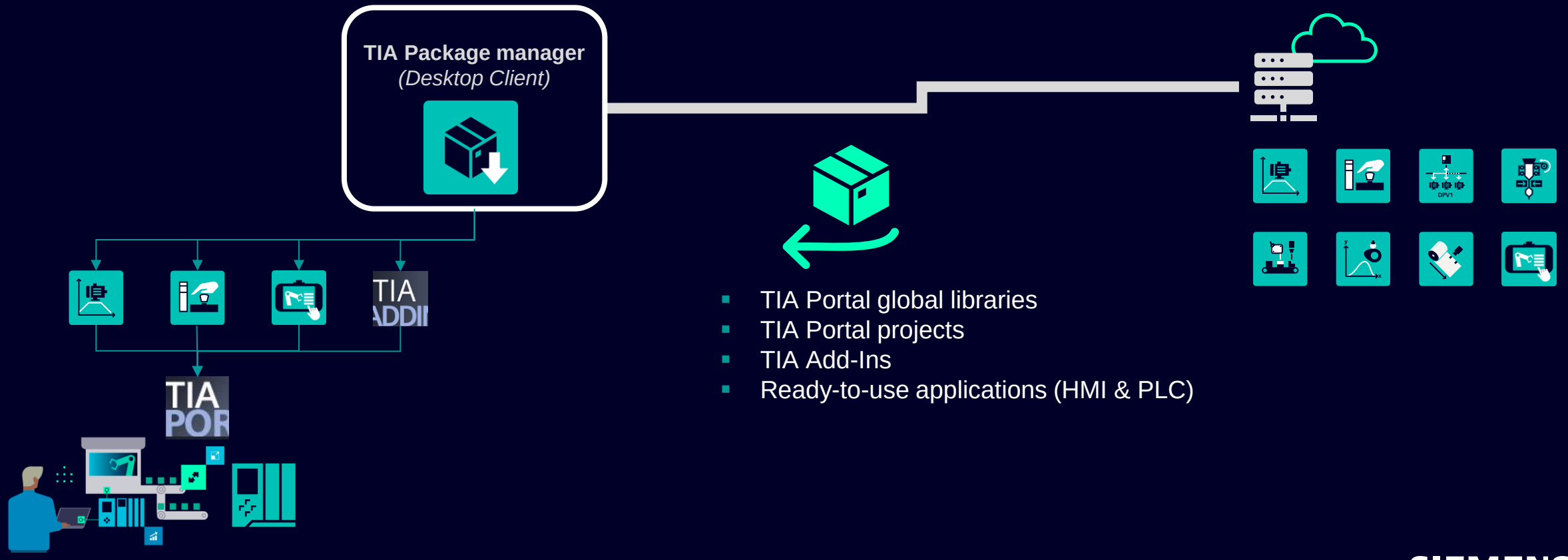


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TIA Package Manager - Introduction

The **TIA Package Manager** is a tool designed to streamline the process of downloading, and managing application packages – *global libraries, TIA Add-Ins and example projects.*

It enhances productivity by simplifying the process of searching, installing and managing libraries - and TIA Add-Ins - for TIA Portal



- TIA Portal global libraries
- TIA Portal projects
- TIA Add-Ins
- Ready-to-use applications (HMI & PLC)

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TIA Package Manager – User Interface

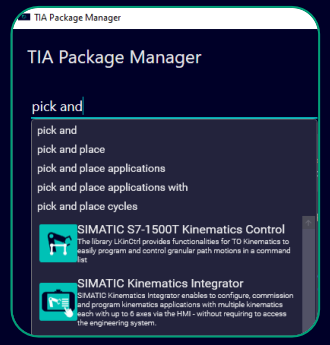


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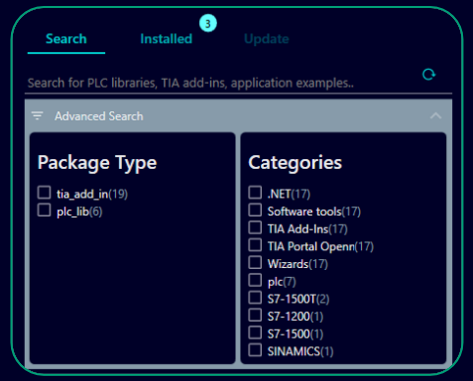
TIA Package Manager - Main features

Powerful search engine

Real-time results and suggestions



Advanced search filters

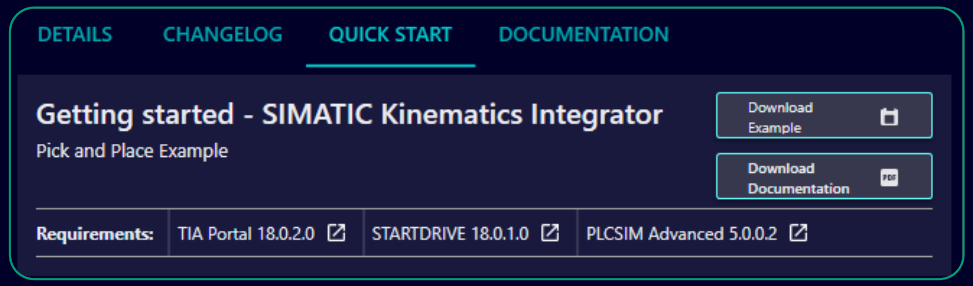


Compatibility check

Verify which TIA Portal version is required for the package

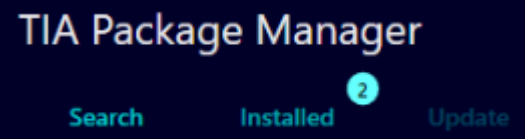


Direct links to SIOS
Access major software requirements directly.

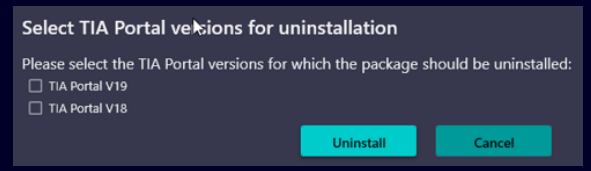


Installation tracking

Monitor which libraries and TIA Add-Ins were installed.



Uninstall or update:
Manage installed libraries and TIA Add-Ins.



TIA PKG

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TIA Package Manager – SIOS release

TIA Package manager
*(***Desktop Client)**



V 1.0.0
SIOS release

8+ Apps

- LSKI
- LAxisCtrl
- LCamHdl
- LLnCtrl
- LCalcMC
- LDrvSafe
- ....

20 + TIA Add-Ins

October / 2024

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How to get the TIA Package Manager

TIA Package manager
*(***Desktop Client)**

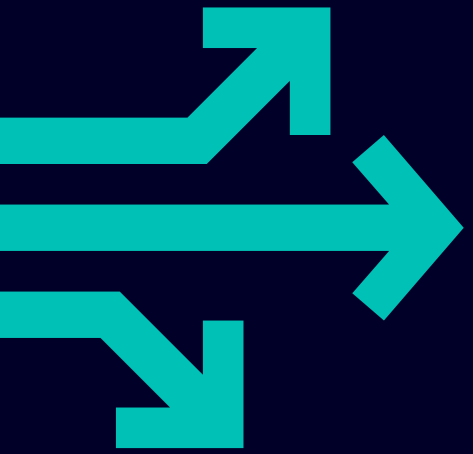


www.siemens.com/tia-package-manager

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TIA Portal V20
TIA Portal Options

Content



01	SIMATIC STEP 7 Safety
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TIA Portal Safety Validation Assistant
Obligation of verification and validation is stated in the standards

Machinery Directive

EN ISO 13849-2 Section 8 | EN ISO 62061 Section 9

“[…] function test of the safety functions in all operating modes of the machine to determine whether they comply with the specified characteristics […]”



Road to CE marking of a machine …

One important step:
Verification & validation

Time-consuming function test

→ Test and document whether the safety functions are implemented as previously specified

CE label

Each machine needs to have the CE label which confirms that all of the relevant directives have been complied



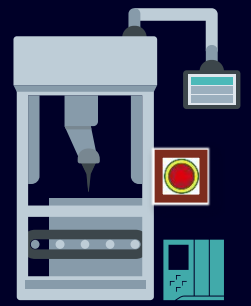
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TIA Portal Safety Validation Assistant
Overview of machine validation

Safety concept, design and engineering

Validation

Documentation

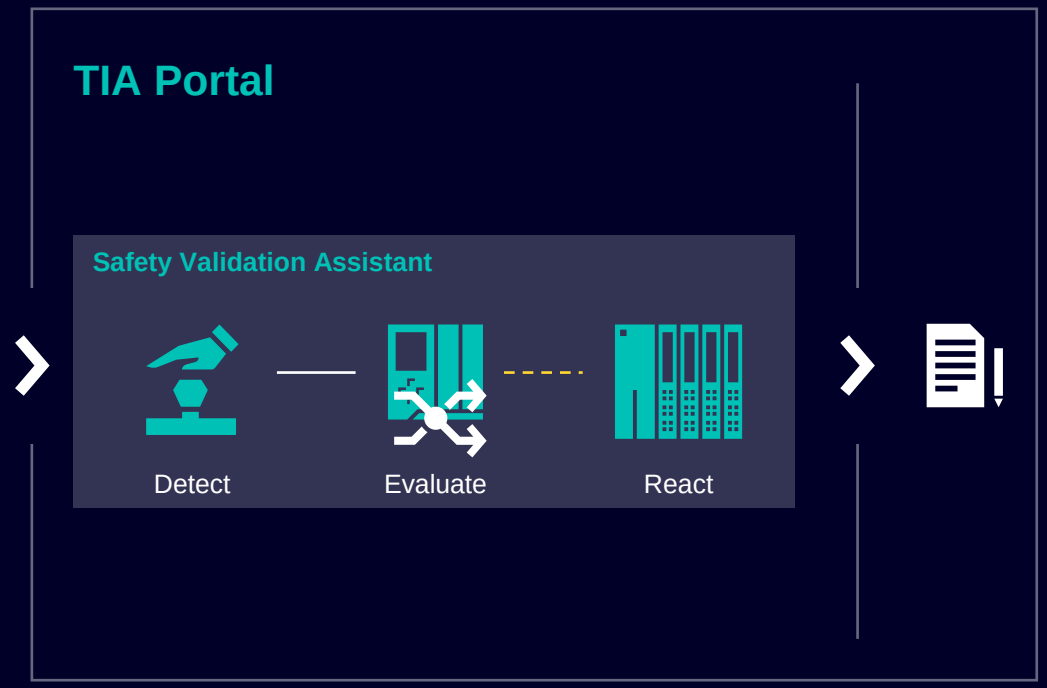


Safety Concept

Safety Design

Engineering

Validation



Solution

Guided validation of the machine safety functions

Easily validate the parametrization of the entire chain of a safety function by using software-guided test wizards.

The Safety Activation Test in TIA Portal Safety Validation Assistant validates the safety function of the entire chain from sensor to actuator. It supports SIMATIC as well as SINAMICS products.

The results can be exported afterwards in a single test report to proof the correct function of the entire safety function chain. The test report is an integral part of the machine documentation.

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TIA Portal Safety Validation Assistant
Delivery forms



	TIA Portal Safety Validation Assistant V20	Software Update Service
Article number for DVD	**–**	**–**
Article number for license download (OSD)	6SL3072-5LA05-0XG5	6SL3072-5AA05-0XY8
Delivery with STEP 7 Prof.	X[1]	X[1]
Updates in TIA Portal Updater	X	X

1 No installation required

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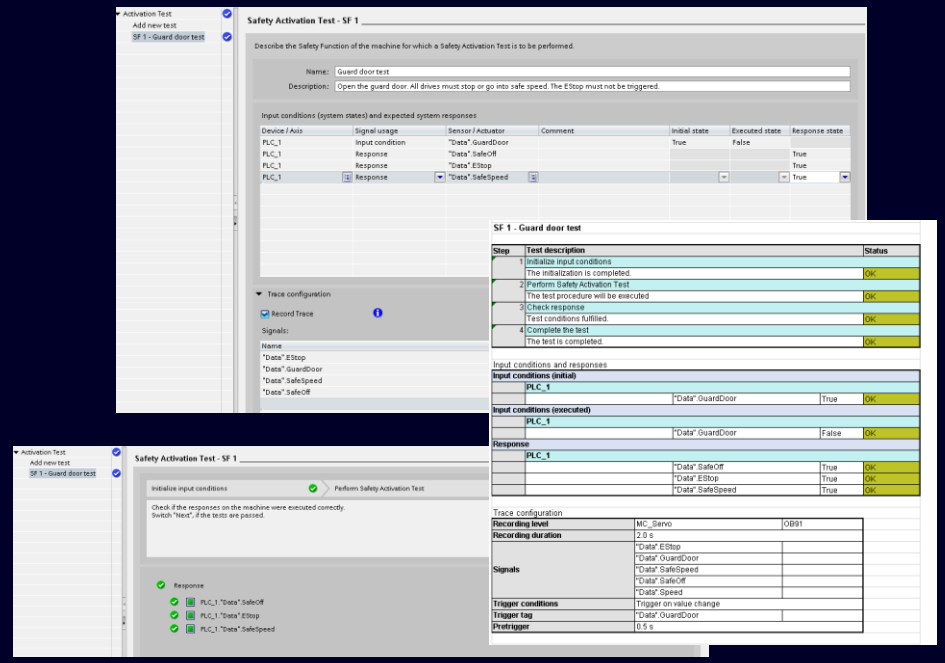
TIA Portal Safety Validation Assistant
Safety Activation Test workflow & required license

Workflow

01 **Definition:** All safety functions via the **wizard:**
Operating mode, input conditions, expected response
(this step can be initiated by the configuration engineer before Commissioning phase are executed)

02 After machine commissioning: **Performing the tests** and run through all defined safety functions via the **guided step-by-step wizard**

03 **Automatic** creation of the **test report** with all necessary information



Safety **Validation** is an important step on the way to the required **CE marking** of the machine!

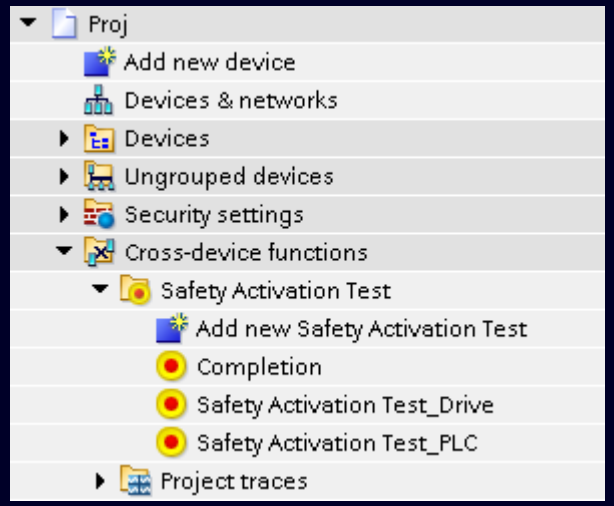
Safety Activation Test is part of the Safety Validation Assistant and thus also part of the TIA Portal **Safety Validation Assistant license**.

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TIA Portal Safety Validation Assistant
How to start

Location in TIA Portal

The Safety Activation Test is located under **Cross-device functions**



Supported Hardware

Depending on the installed software, the following devices are supported:

With **STEP 7**:

- SIMATIC PLC (Standard and Failsafe)
- Distributed IOs (Standard and Failsafe)

With **Startdrive**:

- SINAMICS Drives (With enabled Safety Integrated Functions)

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TIA Portal Safety Validation Assistant
Possible evaluation devices

Every Safety Activation Test needs a device that acts as **evaluation device**. The following devices are supported:

- SIMATIC PLCs
- SINAMICS Drives

The evaluation device contains the logic of the Safety function. The Safety Activation Tests supports the **trace functionality** on the evaluation device.



SIMATIC as evaluation device

- For **any** SIMATIC in TIA Portal
- Access boolean tags for test
- Access all tags for trace
- Access networked devices (periphery, SINAMICS, …) for test

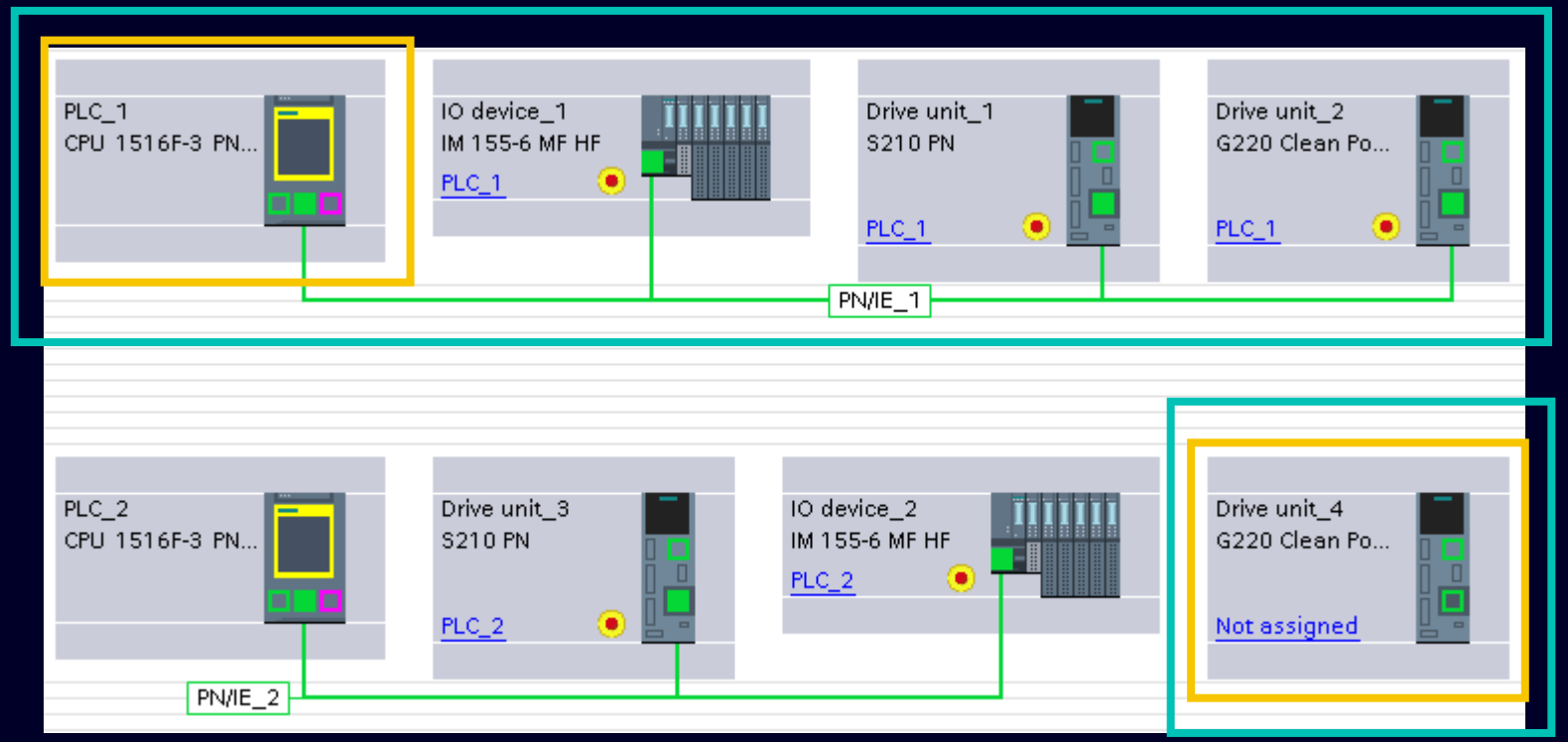
SINAMICS as evaluation device

- For any SINAMICS with **more than 1 F-DI**
- Access Safety Integrated Function status and F-DI status for test
- Access all parameters for trace

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TIA Portal Safety Validation Assistant
Intelligent network analysis

PLC as evaluation device – Access all networked devices in Safety Activation Test



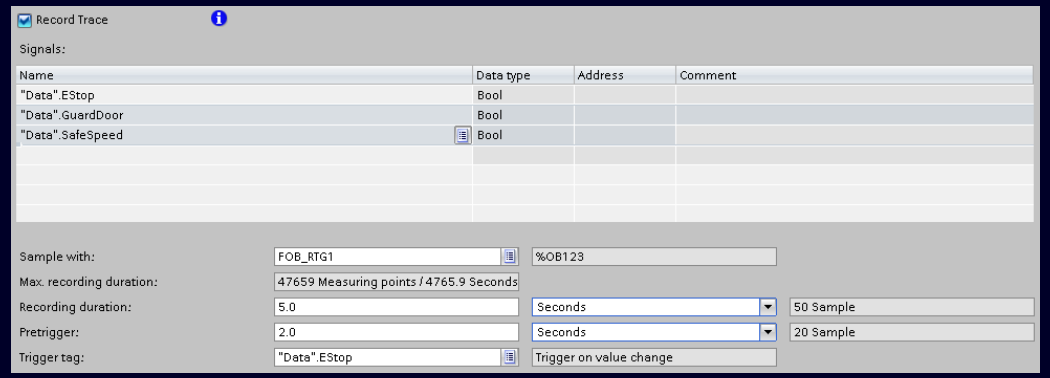
Drive as evaluation device – Access only the drive

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TIA Portal Safety Validation Assistant
Trace functionality

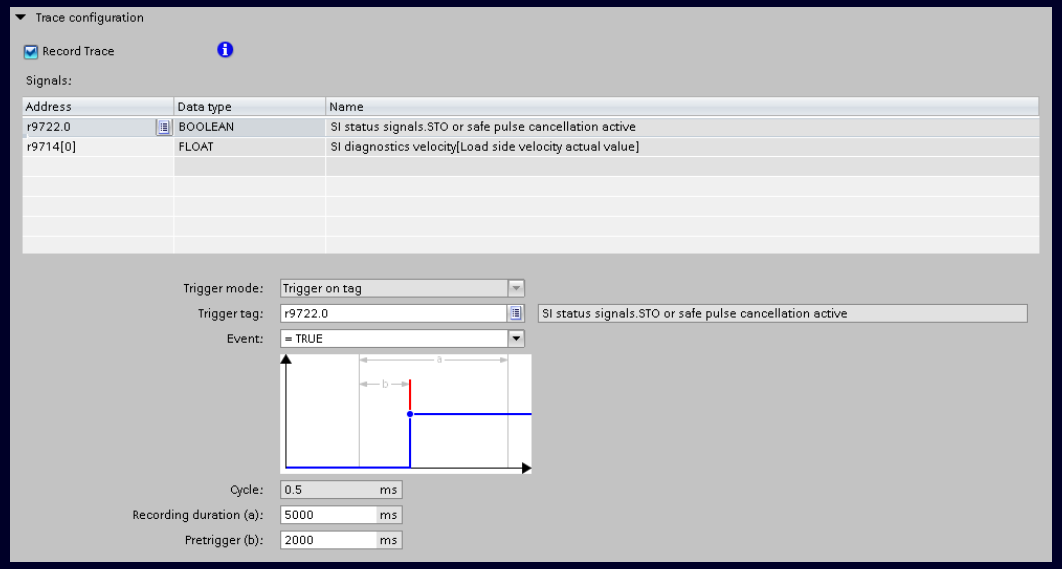
PLC as evaluation device

- 1 trace instance can be used
- All PLC tags available
- Trigger „on value change“



Drive as evaluation device

- 1 trace instance can be used
- All drive parameters available
- Trigger on Boolean signals
- Automatic cycle time calculation

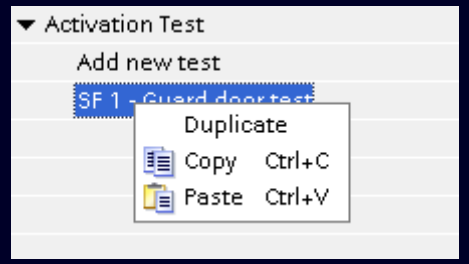


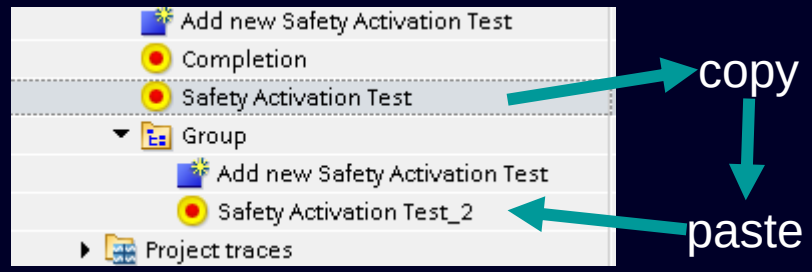
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TIA Portal Safety Validation Assistant
Reusing the Safety Activation Test

Copy functionality

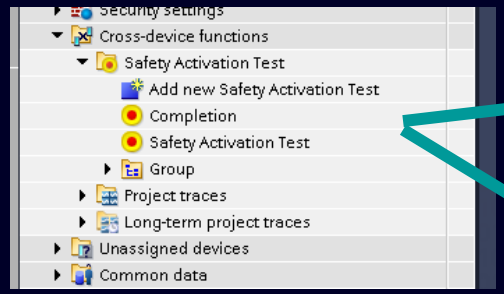
- Duplicate or copy & paste test cases
- Copy & paste a whole Safety Activation Test

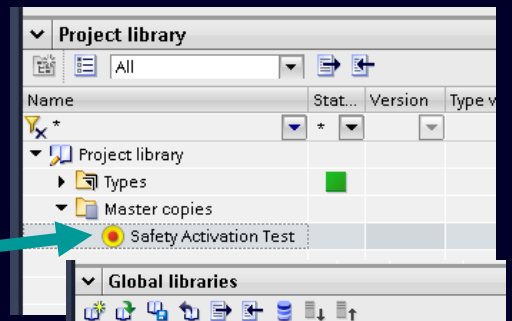


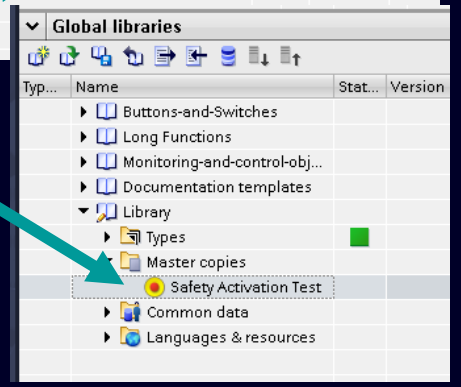


Library support

- Use project and global libraries with Safety Activation Test
- Storage as **Master copy**







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TIA Portal Safety Validation Assistant
Accessing the TIA help

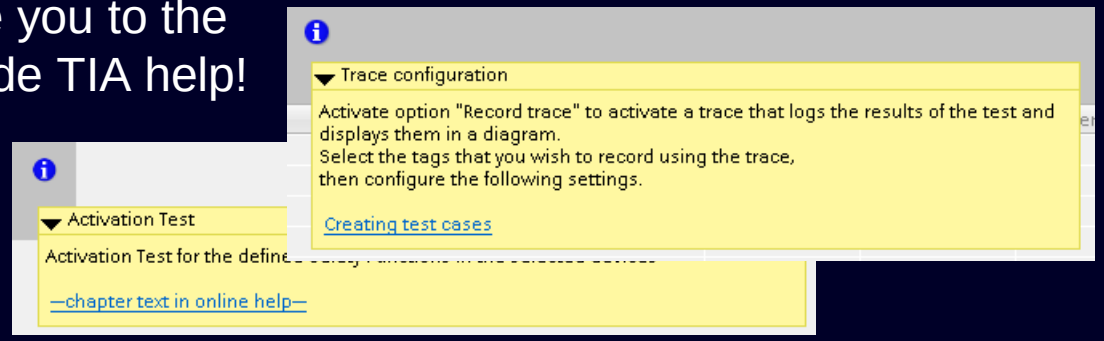
Having a question regarding the Safety Activation Test?



Access TIA help directly by following the 

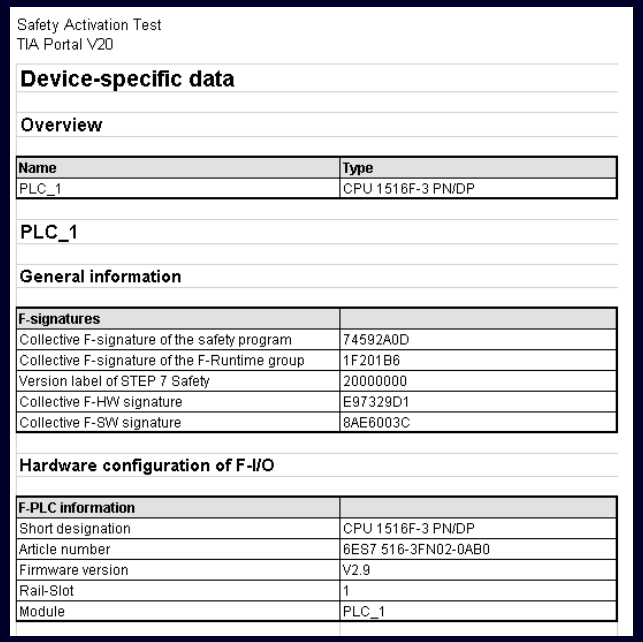


The link will guide you to the **correct place** inside TIA help!



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TIA Portal Safety Validation Assistant
Test report



Safety Activation Test
TIA Portal V20

Device-specific data

Overview

Name	Type
PLC_1	CPU 1516F-3 PN/DP

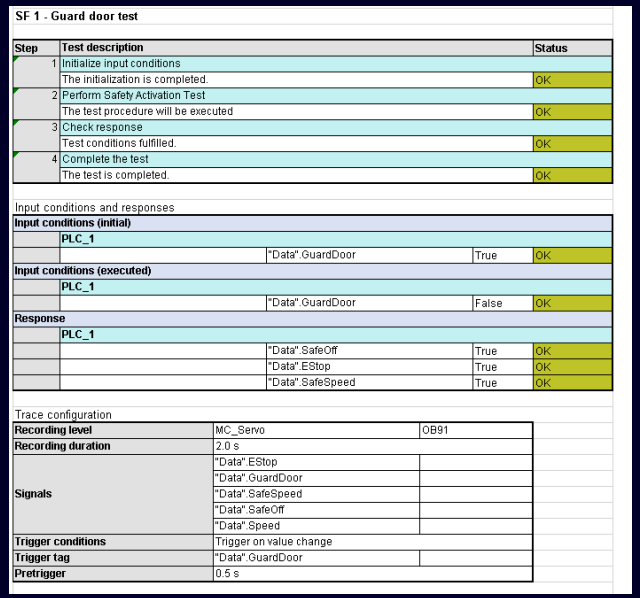
PLC_1

General information

F-signatures	
Collective F-signature of the safety program	74592A0D
Collective F-signature of the F-Runtime group	1F201B6
Version label of STEP 7 Safety	20000000
Collective F-HW signature	E97329D1
Collective F-SW signature	8AE6003C

Hardware configuration of F-I/O

F-PLC information	
Short designation	CPU 1516F-3 PN/DP
Article number	6ES7 516-3FN02-0AB0
Firmware version	V2.9
Rail-Slot	1
Module	PLC_1



SF 1 - Guard door test

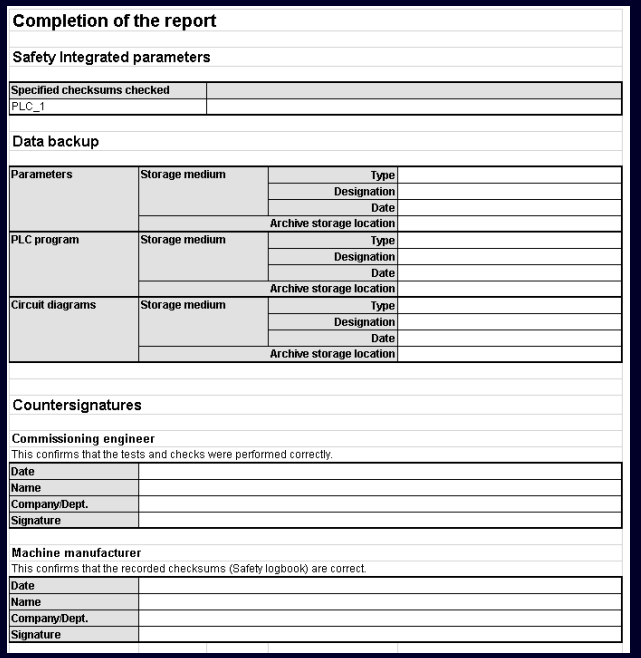
Step	Test description	Status
1	Initialize input conditions	
	The initialization is completed.	OK
2	Perform Safety Activation Test	
	The test procedure will be executed	OK
3	Check response	
	Test conditions fulfilled.	OK
4	Complete the test	
	The test is completed.	OK

Input conditions and responses

Input conditions (initial)				
	PLC_1			
		"Data".GuardDoor	True	OK
Input conditions (executed)				
	PLC_1			
		"Data".GuardDoor	False	OK
Response				
	PLC_1			
		"Data".SafeOff	True	OK
		"Data".EStop	True	OK
		"Data".SafeSpeed	True	OK

Trace configuration

Recording level	MC_Servo	OB91
Recording duration	2.0 s	
Signals	"Data".EStop	
	"Data".GuardDoor	
	"Data".SafeSpeed	
	"Data".SafeOff	
	"Data".Speed	
Trigger conditions	Trigger on value change	
Trigger tag	"Data".GuardDoor	
Pretrigger	0.5 s	



Completion of the report

Safety Integrated parameters

Specified checksums checked	
PLC_1	

Data backup

Parameters	**Storage medium**	**Type**	
		Designation	
		Date	
		Archive storage location	
PLC program	**Storage medium**	**Type**	
		Designation	
		Date	
		Archive storage location	
Circuit diagrams	**Storage medium**	**Type**	
		Designation	
		Date	
		Archive storage location	

Countersignatures

Commissioning engineer
This confirms that the tests and checks were performed correctly.

Date	
Name	
Company/Dept.	
Signature	

Machine manufacturer
This confirms that the recorded checksums (Safety logbook) are correct.

Date	
Name	
Company/Dept.	
Signature	

Overview all relevant data
(firmware version, safety parameters)
→ **Time savings** compared
to manual documentation

All test results of the **Activation Test**
(incl. trace images)

Separate sheet for signatures

Same look and feel as the report from Startdrive **Safety Acceptance Test** for SINAMICS
A **perfect match**!

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Download and Trial

Download TIA Portal V20 and try it for free for 21 days
https://support.industry.siemens.com/cs/ww/en/view/109963850

Download TIA Portal V20 updates
https://support.industry.siemens.com/cs/ww/en/view/109963851
🔔 Add page to mySupport favorites and activate email notification to receive latest updates immediately.

Try without installation effort via TIA Portal Cloud
Activate your 21 days TRIAL access for TIA Portal V20 and previous versions:
https://support.industry.siemens.com/cs/ww/en/view/109772248

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